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# Gleanings in Bee Culture



VOL. XL. APRIL 15, 1912, NO. 8



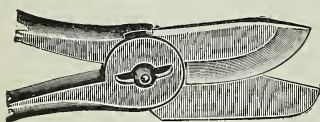
# Special CLUBBING OFFER

Koeth's Kombination Kit is an arrangement whereby one pair of plier handles is made to serve a number of different tools which come as sets of heads. By an interlocking device the handles may be fastened readily to any set of heads; and each part being interchangeable, the heads may be combined so that as many as fifteen or more different tools may be formed. The elimination of many different handles makes a saving in cost, convenience, and weight that will be appreciated by every one who uses tools.

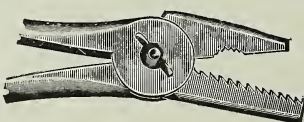
It is on the same plan as one brace for a set of bits, one handle for one set of taps and dies; and there is no more object in having handles for all the plier-like tools than having a brace welded to each separate bit.

This set consists of one pair of handles and six sets of heads, which give the following tools, ranging from ten to eleven inches in length: Pincers, End-cutting Pliers, Harness, Belt, and Leather Punch, Pruning Shears, Tinners' Snips, Pliers, Wire Cutters, Adjustable Alligator Wrench, Pipe Tongs, Nut Crackers, Screw-driver, Tack Puller, Nail Puller, Calipers and Dividers. The heads are of tool steel, drop-forged, ground, tempered, and highly polished. The handles are of steel, ground and polished, and are finished in blue or polished nickel. Each tool is fully warranted.

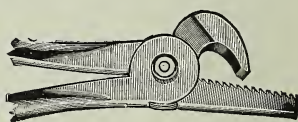
The Kit is invaluable for mechanics, plumbers, farmers, bicyclists, automobilists, or any man who ever lays hand to tools.



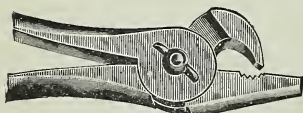
Leather Shears



Double-Header Wrench  
3/8 and 1/2 inch pipe



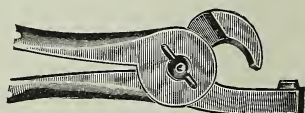
Pipe Wrench  
3/8 and 1/2 inch pipe, etc.



Pipe Wrench  
For a close place



Wrench for Nickel-Plated Pipe  
Small size

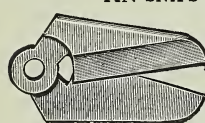


Wrench for Nickel-Plated Pipe  
Doesn't tear the nickel. Fold paper several thicknesses and put around the pipe.

## NIPPERS

One of the most useful of the heads. It is of the same shape and design as ordinary nippers.

## TIN SNIPS



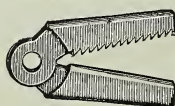
Are nicely beveled and made especially strong. The reversible spring on the handles makes a noticeable addition to their utility. The wing nut furnishes a tension which will make it possible so to adjust these blades that they will cut various thicknesses ranging from tissue paper to sheet iron.



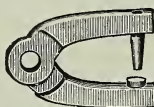
pliers or wrenches can be formed which will prove valuable in certain lines of business.

## THE ALLIGATOR WRENCH

This head is adjustable, and adapted to a wide range of sizes. To engineers, pipemen, and machinists, this one tool is worth the cost of the entire set because of its adjustable features; and by assembling one-half of either the pincers or plier jaw with the ratchet portion of the Alligator jaw, a still wider range of work can be covered.



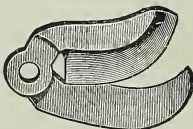
## LEATHER PUNCH



The tubes of this punch are made of hexagon tempered tool steel in the following sizes: 3/32", 4/32", 5/32", which are securely fastened by means of an accurately cut thread, and all are interchangeable. Each Kit is equipped with one of the medium sizes of these tubes.

## PRUNING SHEARS

This head is finished up in the same manner as the Tin Snips, the only difference being in the shape of the blades. Should any part break through faulty construction, a new part is supplied without charge. If with much use a part wears out, at small cost a new part is supplied and the tool is again complete. By combining jaws of different sets many special



The entire Kit with Blue Handles, wrapped and packed in a midget tool chest with hard-wood sides and covers, finished in natural wood, with brass hinges and clasp, \$4.50. Sent by mail or express prepaid to any point in United States with GLEANINGS one year \$5.00.

# The A. I. Root Company, Medina, Ohio

# Cleanings in Bee Culture

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NO. 8

## Editorial

NEXT issue will be largely devoted to the subject of making increase and strengthening weak nuclei. This discussion will be especially seasonable this spring.

### A CORRECTION.

In our editorial notice of the new bee journal, the South African *Bee-keepers' Journal*, in our December 15th issue, we gave the address as Johannesburg, Natal, S. Africa, whereas Johannesburg is in the Transvaal. The initials of the editor are also "G. S." instead of "G. F." Oettle as given.

### NEW SUBSCRIPTIONS ROLLING IN.

In spite of the severe winter losses, new subscriptions are rolling in at a faster rate at this time of the year than we have ever known before except once. The last month shows a gain of nearly 600 new subscribers. It looks as if the winter just passed had not chilled the ardor of a large number of our beekeeping friends, for renewals are coming in at the same steady healthy rate.

### THE DEATH OF NEW JERSEY'S FOUL-BROOD INSPECTOR

We are sorry to announce the death of Prof. John B. Smith, State Entomologist and Foul-brood Inspector of New Jersey. Prof. Smith worked hard for foul-brood legislation in his State, and, with the help of others, finally succeeded in the enactment of an excellent foul-brood law. There was great need of it. He was a good entomologist, and did splendid work in eradicating bee diseases. New Jersey can ill afford its loss. His successor possibly may not be appointed for some time.

### HONEY PROSPECTS FOR THE COMING YEAR.

REPORTS thus far received, in spite of the severe winter losses in some localities, are optimistic, forecasting an old-fashioned honey-year. While it is true there will be a light force of bees in some localities to gather the honey, it seems to be generally felt that this is going to be a clover year in the East. A large amount of snow has cov-

ered almost the entire clover belt for the entire winter. Such a condition, it is felt, means clover and honey. There are a few localities that report that last fall's drouth killed clover out entirely; but these are few and scattering.

In the irrigated regions of the West there will be the usual run of alfalfa honey. Conditions in California, so far as the sage crop is concerned, look much better than they did a month ago; but it is feared that the rains came too late to do any thing better than to make a light yield.

### EXTRAVAGANT ADVERTISING OF FIVE-BANDED BEES.

In our last issue, page 189, in Straws, Geo. M. Steele, of Philadelphia, desired to have Dr. Miller retract his statement to the effect that there were not a dozen colonies in the United States showing *all* five-banded, for he said he could disprove the statement with the bees. Dr. Miller very properly replied by saying that he did not make the statement attributed to him and referred him to the editor. As we were in Florida when the Straw appeared, it is proper for us to reply:

Mr. Steele, in a letter which he submitted to Dr. Miller, says, "I have sixty colonies that will go one better in our 95 per cent of the workers, and some five that will run golden to the tip in 100 per cent of the workers." We cheerfully retract, and offer our congratulations. But we still venture the opinion that Mr. Steele is the only breeder of goldens that can show this high percentage of yellow. If there is another, let him hold up his hand *and furnish the proof*. Mr. Steele has already done this to our satisfaction, and it is but fair that the others should do the same.

What we have particularly protested against is advertising "five-banded bees," and furnishing, after the money is paid, three and four banded bees. That is what makes trouble; for if the "ad" appeared in these columns we are asked to "arbitrate" or make the other fellow quit advertising what he has not for sale and can not furnish.



## WINTER LOSSES OVER THE COUNTRY.

REPORTS are few and scattering, although it is safe to guess that the total loss will be much more severe than for many years past. In most localities where cellar or outdoor wintering prevails, and the bees had sugar syrup or equally good table honey, there were practically no losses. Cellar wintering during the past winter, where the conditions so far as ventilation and humidity were right, has again demonstrated its superiority in extremely cold localities or cold weather. Bees well housed in double-walled hives on good stores have, as a general thing, wintered well. The following is a fair sample showing the value of protection:

I can inform you how my bees wintered. Home yard, chaff hives, in open, wintered perfectly; single-walled, protected by building, loss 20 per cent; cellar, no loss.

Out-apiaries, yard A, single-walled, in open, loss little over 80 per cent; yard B, as above, 75 per cent, yard C, as above, 70 per cent. This is the greatest loss ever experienced. Had the bees been all packed, the results would have been better.

Germantown, O., March 27. O. O. ZEHRING.

In many localities last fall the bees gathered considerable fall honey. Where this was the case some heavy losses have been reported. A queer thing about it is that bees south of the Ohio River have died as well as those north of it. The unusual cold caused them to consume more stores than usual, causing starvation and sometimes dysentery.

The greatest losses seemed to have occurred on or near a line running through the center of the following States: Iowa, Wisconsin, Illinois, Indiana, and Pennsylvania. Losses are reported in Oklahoma, Kansas, and Missouri. Fair to good wintering is being reported in Minnesota, Michigan, Canada, New York, and the New England States. In Minnesota, Michigan, Canada, and New York, where the bees have been housed in cellars or in good double-walled hives outdoors, the losses have been light.

As we said about a month ago, losses will be heaviest on the dividing line where protection of the hives is usually practiced, and where protection such as outside winter cases or double walls is seldom used. Strangely enough, losses are the lightest where it is the coldest.

## WHAT TO DO WITH WEAK DWINDLING COLONIES, AND HOW TO BUILD THEM UP.

Fortunately, spring has opened up very auspiciously. Brood-rearing is starting up well, and bees everywhere will hold their own, providing a severe cold spell does not follow. No one can tell. As a general thing it does not pay to unite little weak nuclei. If the weather is unfavorable they will die whether united or left on their original stands. When united the old bees go back to the old stand. Our Mr. Mell Pritchard makes the suggestion that it would not be a bad idea to unite a lot of weak ones into one hive and put them in a dark cellar and keep them there for a week or ten days, and then set them out. This will give them

an opportunity to form into one colony, and at the same time lose their sense of location, and start over again.

In this issue Mr. Doolittle has an excellent article on making increase. Many of our friends who have lost heavily, and wish to make the survivors go as far as possible, can read it with profit. See page 227.

The Alexander plan of building up nuclei into strong colonies has given splendid results. As many do not have his book, or have forgotten when it was published in these columns, we give it here:

As soon as they have some uncapped brood in their hives, take them to a good strong colony; remove its cover and put a queen-excluder in its place, then set the weak one on top of the excluder and close up all entrances to the weak colony, except what they have through the excluder, down into the strong colony below. Leave them in this way together four or five weeks; then separate them and you will have two good colonies and will have saved yourself all worry about these weak colonies being robbed, chilled, or starved. When we are feeding the other colonies we usually give these a few spoonfuls of the warm syrup in a comb next their brood. This encourages them; and if there is not more than a cupful of bees they don't get much from the feeder under the strong colony. I have explained at bee conventions this way of saving these little colonies, and have received very complimentary letters afterward from prominent beekeepers, saying that this idea was worth more than \$100 to them.

## WHAT TO DO WITH EXTRA QUEENS.

If any of the stronger colonies have impurely mated or undesirable queens, it will be a good time to requeen with pure blood from the united nuclei. Of course, the objection might be raised that a queen that will not raise bees that will pull through a winter like this should not take the place of a queen whose bees did stand the rigors. But it may be that the pure queen did not have the same chance that the poorly marked queen had. For example, we find that our colonies that supplied nuclei or pound packages of bees in September and October, in most cases died because they had been robbed of a very important part of their bee family. If, for example, it is necessary to go into winter quarters with three pounds of bees, and we take away one pound, we run the chances of losing the whole colony.

## DEATH OF S. T. PETTIT.

MR. S. T. PETTIT, of Aylmer West, Ont., Canada, died on the 25th day of last month in his 83d year. He was the father of Morley Pettit, Provincial Apiculturist of the Apicultural Department of the Ontario Agricultural College of Canada, and also father-in-law of Mr. R. F. Holtermann, formerly editor of our Canadian Department, and now an occasional contributor to these columns.

For many years Mr. Pettit was one of the most prominent bee-keepers of Ontario. He was a man of pronounced opinions and of sterling qualities. Among other things he was the discoverer of the plan for making bees fill the outside rows of sections as well as the inside. This was done by putting perforated dividers or separators out-

side of the outside rows of sections. This made a clustering-space for the bees, approximately one inch thick between the outside of the hive and the combs themselves. The general effect of this thick wall of bees was to make the comb-building temperature the same as the interior of the super. In connection with this, Mr. Pettit used long narrow wedges between the bottom of the sides of the hive and the bottom board, so placed that the entrance would be enlarged. This would make the front end of the bottoms of the brood frames out of reach of the bees. The purpose of this was to cause the incoming fielders, laden with honey, to go to the *sides* and back end of the hive and up to the outside rows of sections, and there deposit their nectar.

Mr. Pettit was also the inventor of a special honey-strainer used during extracting. A description of this will be found in the latest edition of the A B C and X Y Z of Bee Culture.

During the time when there was some talk of feeding bees sugar syrup to produce comb honey, Mr. Pettit came out in all the bee journals, most strenuously opposing the proposition. He felt that it would be nothing more nor less than a fraud on the public; and while he admitted that conscientious beekeepers would sell such a product for only sugar honey, he felt that many others, not stating its source, would attempt to sell it for natural floral honey. Others joined with Mr. P., and the matter was soon dropped.

During the five months preceding his death Mr. Pettit was a great sufferer; but in those days, we are told, he loved to speak of his Lord and Savior.

#### WHY BEEKEEPERS SHOULD PRODUCE MORE COMB HONEY THIS YEAR.

We have already alluded to the fact that the markets are practically bare of fancy and No. 1 comb honey. There are some few lots of uncandied comb honey left, but that is about all. There is no lack of extracted, even though last year was the poorest on record for the production of honey. This goes to emphasize the importance of producing more comb and less extracted. But right here a caution should be entered. Nothing but the very finest of table honey should be put into sections. There are several grades of Southern honey of very fine flavor; but because they are unknown to the Northern markets that take comb honey they can not be put out in that form. About all the kinds of honey it is safe to put into sections for a Northern market can be counted on the fingers of one hand. Let us name them over. First and foremost we may put clover. This may have a little mixture of sweet clover or basswood without hurting it in the least. While the pure basswood comb honey will pass muster, it is such a scarce article now that we find it only now and then mixed in varying quantities with clover.

Next in order we put mountain sage. It is of fine flavor and does not granulate readily. We place it ahead of alfalfa because it does not candy. Alfalfa makes a fine honey for sections, excellent in flavor and body; but it has just one bad defect—its tendency to candy too rapidly. Some go so far as to say that *all* alfalfa should be extracted. We do not share this opinion, because alfalfa comb honey, if sold before the holidays, will bring enough better price than alfalfa extracted to warrant its production.

These three sources—alfalfa, clover, and sage—cover the main dependence for section honey. We may now add to this list, for certain localities, buckwheat; but buckwheat comb honey should be sold only in eastern markets, particularly round Albany, where it seems to have a good demand. Thistle honey and willowherb comb honey make a fine section honey; but the localities where they can be produced are so limited that they are scarcely known in the market.

There is some excellent Texas honey, such as huajilla (pronounced wah-heel-ya), and catclaw. These make excellent comb or chunk honey. But these honeys rarely find their way into Northern markets. Local consumption seems to take care of them; and therefore it follows that those who are located in the clover, alfalfa, and sage districts should produce as much comb honey as possible this summer. If there should be any thing like a good flow of honey this season the market is liable to be flooded with extracted.

In this connection too much importance can not be placed on the necessity of having all the sections well filled with either No. 1 or fancy. No. 2's are slow sellers, and very often it pays better to cut them out of sections entirely, pour good extracted honey over them, and sell the product in pails in the local markets.

It is equally important to use strong well-made shipping cases. They must be neither too large nor too small; should be provided with corrugated paper at the top and bottom, and it will pay in the end to use cartons. The main reason why comb honey has caused so much trouble between buyer and producer is on account of imperfect packing. It would not cost half a cent a pound to put up comb honey *right*, and the half-cent investment will bring back five cents or more per pound, and sometimes even ten cents more; because the buyer does not want broken-down comb honey at any price.

Careless and ignorant beekeepers have only themselves to blame for the state of the comb-honey business; and it is surprising how even our up-to-date producers—some of them who write for the papers—still put up their comb honey. They remind us of the economical husband in the current-date cartoons. There is a false economy and a real economy. If we put the comb-honey business back where it originally was, we must, first of all, pack it properly, not only in the car itself, but in the shipping



cases. In less than car lots carriers should always be used with a liberal amount of straw under the cases.

**LIST OF QUEEN-BREEDERS WHO AGREE TO BOIL THE HONEY THEY USE IN MAKING QUEEN-CAGE CANDY.**

PRACTICALLY all the queen-breeders in the country, except four, have agreed to boil all the honey they use in making queen-cage candy. One writes that he is in a locality where there has never been any foul brood. He even goes so far as to say that there is none in his State. "Why go to the expense of boiling?" he asks. Another one says there is no foul brood within five miles of him. The last man, and he is one of our prominent breeders, ought certainly to boil his honey, because we know that foul brood is not far away, and it may ultimately work into his yard before he knows it. We do not feel like giving the names of these breeders, as the trade might refuse to buy queens of them. We feel sure they will be glad to fall into line after we put the argument up to them a little stronger.

The fact is that two or three of the leading foul-brood inspectors of the country have had pretty good proof put before them, showing that the disease had been carried into localities through queen-cage candy; and when it is so little trouble to boil the honey, every queen-breeder should comply with this simple precaution.

The following is a list of the queen-breeders who have agreed to boil the honey used in making queen-cage candy:

Herman Ahlers, Necanicum, Oregon.  
F. M. Babcock, Fredonia, N. Y.  
Mrs. J. W. Bacon, Waterloo, N. Y.  
H. L. Beaty, Heyburn, Idaho.  
E. W. Brown, Willow Springs, Ia.  
Geo. J. Brown, Tustin, Cal.  
H. C. Clemons, Boyd, Ky.  
Benj. B. Davis, Springhill, Tenn.  
John M. Davis, Springhill, Tenn.  
W. J. Forehand, Fort Deposit, Ala.  
N. E. France & Son, Platteville, Wis.  
D. T. Gaster, Randleman, N. C.  
John H. Gibbs, Berlin, Md.  
Jos. Gray, Wasco, Cal.  
J. E. Hand, Birmingham, Ohio.  
Geo. B. Howe, Rock River, N. Y.  
S. J. Maltby, College Point, N. Y.  
J. P. Moore, Morgan, Ky.  
H. G. Quirin, Bellevue, O.  
G. H. Rea, Reynoldsville, Pa.  
L. H. Robey, Worthington, W. Va.  
The A. I. Root Co., Medina, O.  
E. A. Simmons, Greenville, Ala.  
P. G. Snyder, Swarthmore, Pa.

We have heard from two or three other queen-breeders who say they have never had any foul brood in their locality. One said that there had never been any in his State; but the fact is, these men can never determine absolutely whether their honey is free of infection or not. We have known of cases where European foul brood got a pretty good headway in a queen-breeder's yard before he knew it. Now, this man had been sending out presumably healthy queens in cages having candy made with honey from that same yard. European foul brood does not manifest itself quite so strongly as the American type. Then, again, American foul brood may exist in a hive of

strong vigorous Italians a couple of years before the owner knows it. There will be only here and there an occasional cell. We remember in particular one case of looking over a man's bees. He very confidently asserted that there had never been any foul brood in his locality. When we opened one hive we thought we detected the familiar odor of foul brood. On applying the nose a little closer, we found, sure enough, a faint odor of what we felt sure was the disease. We went through that colony three different times before we actually found a cell containing diseased matter. There were no perforations; but there were just two cells that showed that the disease was present beyond a question. If we had not detected the odor we would have passed that colony as O. K.

At other times there may be perforated cells not manifesting much odor. A good deal depends on the condition of the weather. A slight breeze will carry off any odors so that they will not reach the nostrils of the inspector. We wish to say in all seriousness to our friends the queen-breeders who do not think it necessary to boil their honey, they are taking a position that is dangerous to the industry. We like the position taken by Mr. J. P. Moore, who says:

Kindly add my name to your list of queen-breeders who boil all honey used in making queen-cage candy. I fully intended to write you in reply to your editorial, but in the rush of business I forgot to do so.

I have honey that I know is all right; but, as you say, unless *all* queen-breeders boil the honey used in queen candy, disease is likely to be scattered in some parts of the country.

Morgan, Ky., Oct. 12.

J. P. MOORE.

There are, perhaps, some queen-breeders who scout the idea of foul brood being carried through queen-cage candy. We have talked with a number of the foul-brood inspectors during the past year, and practically every one of them agrees that the disease may be carried in that manner. The very fact that foul brood is breaking out in new localities into which no bees have been shipped, and neither combs nor brood, is somewhat significant. If any one has any doubt on this point, let him write to Mr. Geo. F. Demuth, formerly foul-brood inspector of Indiana, now of the Bureau of Entomology, Washington, or N. E. France, Platteville, Wis., who is the oldest foul-brood inspector, in respect to his years of service, in the United States.

**DIRECTIONS FOR BOILING.**

Some have asked for directions for boiling the honey. It depends somewhat upon the consistency of the honey, but ordinarily we add about a pint of water to the gallon and boil it for seven or eight minutes. When cool, if the honey is then thicker than it should be for making the candy, it shows that a little more water should have been added. If the honey is very thin in the first place, less is needed. At our first attempt, we did not thin the honey; and it was so waxy and scorched after the boiling that it was unfit for queen-cage candy.



# Stray Straws

DR. C. C. MILLER, Marengo, Ill.

POULTRY in the United States, in 1910, according to Bureau of Census, was worth 14.79 times as much as bees. [Bees are not so far behind as one might suppose.—ED.]

"THE INCREASED honey-yield which is possible by even a reasonable amount of effort in selecting and breeding bees is little realized by the majority of us."—Arthur C. Miller, *American Bee Journal*, 50. Right you are, Arthur.

THE ORIGIN of the plan of starting queen-cells on a horizontal comb seems to be in doubt, p. 177. It may be labeled "Made in Germany." Haven't time to look it up now, but I first saw it in a German bee journal, and gave it in a *Straw* a few years ago.

F. P. CLARE, you won't mind if I revise your figures, p. 179, will you? You took the word of some one else for it that the Langstroth frame is some two square inches less than the 16×10-inch frame of Mr. Simmins. Figure it up for yourself, and you will find that the Langstroth ( $17\frac{1}{2} \times 9\frac{1}{2}$ ) contains  $160\frac{3}{4}$  square inches, a trifle more than the 160 square inches contained in the 16×10 frame!

J. L. BYER, *American Bee Journal*, p. 48, says that in Ontario the claim that Italians are more immune to foul brood than blacks refers only to European foul brood, not to American foul brood. Italians being worse at robbing than blacks, his experience is that they contract the disease oftener by robbing than the blacks. He thinks it's all "moonshine" about resisting the disease after it is once contracted. [Byer is right.—ED.]

"THE SPECIALISTS who are producing extracted honey, and are making the most money, do not average over 50 pounds to the colony."—Wesley Foster, *American Bee Journal*, 46. That's quite a bit below the general estimate; but so much the worse for the general estimate. [It depends upon what you mean by "general estimate." Our A B C and X Y Z of Bee Culture puts the average for comb honey at 35 lbs., and from 25 to 50 per cent more for extracted.—ED.]

MARCH came in like a lion and went out like a whole menagerie of lions. [It is like a lamb hereabout. This 5th day of April it is a good deal like the weather we left in Florida. The only thing we fear is that it will not last long. However, Dame Nature has been giving us a long steady cold, and we are hoping that she will now give us enough warm weather so that we can save the remnants of our colonies that did not die in winter.—ED.]

REPLYING to G. L. Tomson: H. A. King never published *The American Bee Journal*; but if I am correct he or his brother, A.

J. King, published another bee journal. I do not think the patent on the American hive was ever annulled. Rev. L. L. Langstroth claimed it was an infringement on his patent, and there was much bitterness about it. Shortly before the patent expired Mr. King came out in a statement that his conscience would not allow him to take money for it, but I never heard that he refunded money he had taken or made any reparation to Father Langstroth for infringement. [A. J. King published the *Beekeeper's Magazine* for a number of years; but H. A. King and A. J. King were associated together in the manufacture of bee supplies in the early 70's.—ED.]

WHEN I GOT through reading April 1st GLEANINGS I couldn't tell whether a two-cycle piston with an exhaust cylinder escapes the gas of the planetary system better than a  $167\frac{1}{2}$  h. p. transmission or not. Any way, I sympathize with that fellow who grew twenty years older in ten years through worrying about hauling bees with horses, and I'd like to go back 20 or 30 years and begin over again with autos. [Say, doctor, you are badly mixed up in automobile nomenclature; at any rate, you do not have to know about the inside mechanism of an automobile, neither is it necessary to understand the function of the carbureter, transmission, and all such, to be able to drive the car. But it is mighty convenient to know all of these things when it takes a notion to stop ten miles from nowhere. You are not yet too old to learn. A. I. R. is driving a little auto, and it is not often when the machine "balks" that he can not make it go.—ED.]

STILL AIR at zero is less of a hardship for a colony than a gale with the temperature 30 degrees higher. Never mind about crediting that to Allen Latham, page 212. Allen won't mind if I steal his thunder. I can't fix it up in quite so good shape in my own words, and it's a truth too little recognized. That's why it may be harder to winter outdoors here than in some places a long way north of here. There are times here when hour after hour, if not day after day, we don't have air—just wind. And it's no 30 degrees above zero either. [It is true that still air, although the temperature be much colder, is not nearly as severe on bees as a warmer temperature when a gale is on. This shows the importance of suitable wind-breaks for bees wintered outdoors. There may be a gale of wind outside of the beeyard and yet the air be almost quiet inside. We have seen this time and time again at our home apiary here in Medina. The outside of the yard is surrounded by tall evergreens on the north and west, while the east and south sides are protected by factory buildings.—ED.]

# SIFTINGS

J. E. CRANE, Middlebury, Vt.

That is a good point made by Louis H. Scholl, page 38, that the beekeeper who has every thing in readiness for a crop of honey can look the future bravely in the face and feel sure he will conquer.



Riding by rail recently from Washington to Detroit I saw but two yards of bees, and one of them consisted of a few old box hives. This looks as though the country were not overstocked as a rule.



Some persons hesitate to start an outyard because they have no horse; but Mr. Demuth, of the Department at Washington, told me not long ago that he had hired a horse for this purpose at an expense of not over fifteen dollars.



It is interesting and sometimes amusing, and almost always instructive, to notice how different persons look at a particular subject from different angles. For instance, Mr. Wesley Foster, page 71, Feb. 1, gives the statement of Mr. F. Rauchfuss that comb-honey markets have been developed which demand Western honey, and pay a good figure. Now, one would naturally infer that those Colorado beekeepers had worked up a special market for Western or alfalfa honey; but I was talking the other day with an extensive and very intelligent beekeeper from the middle West who claimed that this is not true, as the older States had worked up the comb-honey demand or market in the East, and the alfalfa beekeepers had just stepped in and were reaping the benefit of markets already developed. He stated further that in the past, in one or more instances, he had established a market or demand for comb honey at an expense of 25 cents a pound to begin with. If this were all, it would not be worth talking about; but he said further that those Western beekeepers were doing great injury to our Eastern markets, not because of the quantity of honey, for there is a demand for all, whether from the East or West, but by putting honey on our Eastern markets that will granulate before it is consumed, thus disgusting alike the consumer and retail dealer who had previously used only Eastern honey that granulates more slowly. To my mind there is no honey produced in quantity that compares with good alfalfa granulated honey, with all wax removed; and if a market could be developed for pure granulated alfalfa honey or for "honey butter," as some call it, I believe it would be for the mutual advantage of producer, dealer, and consumer.



Then, again, there is the wintering problem, and it is a problem of great importance.

How differently it is regarded by different beekeepers! There is my good friend, Arthur C. Miller, a very careful observer, who says, page 73, Feb. 1, that when the external temperature has been nearly level for a day or two there will be found to be a difference of only one or two degrees between the inside and outside of a hive, whether in single or double walls, and I believe he states the truth. Then there is my friend Byer, a rather small man who does some large thinking, who has found the temperature between the inside and outside of a hive to vary from twenty to nearly fifty degrees, and I believe his statements equally true. Whence comes this great difference? In wintering bees in the extreme North there is always one major problem to be solved: How shall we get rid of the moisture generated by the bees, and mingled with the air and heat of the hive, and retain the heat produced by the bees? If we wished to get rid of both heat and moisture, or retain both, it would be simple indeed; but the heat must be retained and the moisture thrown off. Friend Miller goes at it one way and Byer another. Miller would ventilate his hive freely, giving about nine square inches of opening to each cubic foot of space inside his hive, with the result, as he says, of but one or two degrees difference between inside and outside temperatures. And it seems reasonable that it should be so. If we were to ventilate our dwellinghouses in the same proportion, a room 15 feet square and 9 feet high would require an opening to the outside equivalent to six good-sized windows with the sash out. Presumably the temperature would be but one or two degrees warmer inside than outside, whether the walls were single or double. It might dispel the great white plague; but, oh my! wouldn't we shake and shiver with the temperature 20° below zero, and the wind blowing a gale? Mr. Miller would compensate for this loss of heat by the use of dark paper to absorb the heat of the sun; but the sun does not shine nights nor on cloudy days, and there are many such.

On the other hand, Mr. Byer has a smaller entrance open and well packed, and lets the moisture percolate slowly through the warm packing that retains a large portion of the heat. That the moisture goes through the packing is readily seen by placing a pane of glass on top of it, when it soon collects moisture on the under side. That the heat is retained is proved by such observations as Mr. Byer and others have made. With suitable packing and small entrances (a half-inch square is enough if so arranged as not to become clogged) I have found hives and combs as clean and dry in March as in November whether the sun shone on them or not. I have also found the constant change of temperature a decided disadvantage.



# Beekeeping in the Southwest

LOUIS SCHOLL, New Braunfels, Texas

## A MOST USEFUL HAMMER.

Spilling a boxful of tacks or small nails in the soft dirt covered with trash is enough to make anybody lose his temper unless controlled. But the writer dropped nearly a quart of small tacks into just such a place, and did not lose his temper. Instead, the first thought was about that magnetic hammer mentioned several years ago in this department, and which kind has been in use in our work ever since. With this hammer every one of the tacks was quickly picked up clean from dirt and trash, and they were all in the box again, looking as though they had never been out of it. This is not the first time that one of these tools has done such service, either. The magnetic hammer has an important place in the beekeeper's outfit once its worth is known. It does not pay to purchase the cheap kind that are so often seen in use, and which do not give very good satisfaction. A good strong magnetic hammer that can be depended upon at all times can be used in many ways.



## THAT HORTICULTURAL NUMBER.

GLEANINGS can pride itself with a piece of work that is of more value to the country at large than any other publication on the subject of "bees and horticulture." The pages of the March 15th number are so full of this information that it is a veritable bulletin on the subject. Ah! if the dissemination of such exceedingly valuable matter could be placed in the hands of every farmer and fruit-grower, and if it could reach the multitude of persons who are not acquainted with or do not understand the interdependent relations between the honey bee and plant life, what would be the result in better and larger crop productions affected by the proper pollination of the flowers and blossoms? But GLEANINGS, with its wide circulation, is doing a great work through this "horticultural number." Every reader should preserve this copy and make use of it whenever possible. [We have already sent out over a thousand copies of the March 15th issue to fruit-growers whose names were furnished us by our readers in various parts of the country. We sincerely hope these may be the means of bringing about a greater appreciation of the bees on the part of these particular fruit men, at least.—ED.]



## THE SUBJECT OF BULK COMB HONEY.

I do not want to give the impression that it is my intention to "harp continuously" on this subject; but there is a reason for taking up the matter at this time. I have learned during the last two years that my prediction (that bulk comb honey could be profitably produced in the North) was not wrong, as many claimed. Through many letters I have learned that bulk comb honey can be produced *and sold* in the North. It

was found by beekeepers, who tried it on a small scale at first, that they could sell all they could produce *right in their neighborhood, and to people who never cared to buy extracted honey or high-priced section honey.*

In this lies one of the greatest and most valuable arguments in favor of bulk-comb-honey production. The valuable point is in that it is possible to sell honey to people in many localities who do not buy the other kinds. This creates a new demand, and insures a larger consumption of honey by a larger number of people over a greater area. The result is a better distribution and less slump in the generally overcrowded honey markets.

Of course, I do not predict that bulk comb honey will replace other kinds to the extent it has in Texas; but when produced *with* the others, and disposed of in places where it will be taken, we do not doubt for a moment that a greater consumption of honey could be worked up, and that prices would be stiffened as a consequence.



## COTTON HONEY.

There seems to be a great difference of opinion relative to the quality of cotton honey so much produced in the Southern States. According to the A B C and X Y Z of Bee Culture regarding its flavor, you add, "As a rule it must be used for manufacturing purposes;" and in speaking of its qualities we find this paragraph: "Cotton honey has the peculiarity, when confined, of bursting the receptacle in which it is held. Whether it ferments or generates gas has not been definitely determined. It can, however, be put into casks, providing there is plenty of air-space left to allow for expansion."

According to our experience we believe that this needs a little correction. But the difference in locality and in atmospheric conditions has a surprising effect on the nectar yield as well as upon the quality. Hence the experience of others differently situated may bring out information that will warrant leaving the statements about cotton honey unchanged in the A B C book. We have arrived at a definite conclusion, however, and would like to invite all the readers in the Southern States to write us concerning cotton as a honey plant, its character as a yielder of nectar, the color and quality of the honey, and its keeping qualities. We should like to know the extent of the yield of cotton honey obtained both in a single year and for a period of years—the supply, demand, and the price obtained.

I have under contemplation an extensive illustrated article on cotton as a honey plant; and before completing it I desire to know more about this subject in localities different from my own. It is hoped that many responses will arrive at an early date.

# BEEKEEPING IN CALIFORNIA

P. C. CHADWICK, Redlands, Cal.

The automobile, without doubt, will largely take the place of the horse in apiary work; but old Dobbin will be found wending his way up the rough canyon roads and around the foot-hills for some time yet.



Hives should not stand in the shade in this country. There is a difference of from 25 to 45 degrees between the temperature of day and night, which makes the morning sun valuable in getting the bees warmed up and into the field as early as possible. I have fourteen colonies in my back yard, on which I do much of my experimenting and make observations. A part of them are under orange trees, and I find these much less active than those in the sun, except on very warm days.



Mr. J. K. Williamson, of this city, and widely known in the southern part of the State, has sold most of his bees and moved to Mendocino Co. Our local beemen will miss him much; for, besides the convenience of his little hive factory and excellence of his workmanship, he was much consulted on questions of bee management, for he is a close observer, with more than 40 years of experience, 23 of which were spent in Redlands. It is safe to guess that he will soon be in the business at his present location.



No longer does my mind feel akin to that of the "man from Missouri." I have been "shown." It rained long and hard, and doubtless much good will result; but, alas! too late, I fear, to result in the benefit many looked for; besides, it is the off year with the sages, and that, to my mind, is significant. My bees have little more brood than at this date a year ago, due to the long drouth followed by cold stormy weather. The redeeming feature is that I have a much better supply of old bees to support brood-rearing when the weather warms up.



Elias Fox, p. 180, Mar. 15, has taken exceptions to my comments on his bee hunting. He says he would like to live in a country where he could find nine bee trees while walking a distance of two miles, and that he would soon have the bees in hives, or destroyed if diseased. If he could get a permit from the government to cut the trees he could find on this one reserve that there would be a lifetime job ahead of him, and he might safely order a few hundred hives to begin with. Trees that are now sound would be decayed, and contain hollows large enough to hold bees before he got through. Eastern people have little idea of the number of wild bees in this country. Mr. J. D. Bixby, of Covina, Cal., told me of a man

who, having lost most of his bees, took, I think, 140 empty hives, put them up in trees, and caught 120 swarms in one season. In the season of 1905 I divided two strong colonies, that were ready to swarm, into eleven hives, giving each two frames of brood with a queen cell. Six of these gave me a full extracting before the season's close. I can make colonies cheaper than any man can chop them out of trees. It doesn't pay here.



Mr. A. F. Wagner, of El Centro, Cal., p. 144, March 1, has quoted only a part of my sentence on p. 39. Read the two following lines of my article. There seems to be some concern about my knowledge of the foul-brood law, for on p. 700, Nov. 15, Mr. T. O. Andrews says I made a made a very unwarranted attack on it. Now Mr. Wagner tells how the inspector is appointed and how he can be removed. However, here in San Bernardino Co. we have one of those non-removable kind, and we have tried in vain, with petitions, personal talks with the supervisors, and every available means, to get the politician out and a bee inspector in; but we have failed. Why? because the law is *weak* in allowing the office to be at the disposal of the supervisors instead of the beekeepers. A chain is no stronger than its weakest link, neither is a law. But so long as our county is cursed with an inspector such as we have I will continue to pound the law; and to those who desire, I will extend the privilege of pounding me.

If Mr. Wagner had been before the State Association, and heard the discussions on a resolution offered by Mr. Geo. L. Emerson, of Los Angeles, requesting the Board of Supervisors of San Bernardino Co. to remove the present inspector, he would doubtless have a different view of the law. Mr. Emerson's resolution passed without a dissenting voice. Mr. Wagner says, "Do we want the Governor to appoint our inspector?" By all means we do; but we want the beekeepers to have a say about whom he appoints—in short, leave the selection in the hands of the beekeepers, and the legalizing of the appointment with the Governor. Truly it is a condition and not a theory that is confronting us.

## Cramps Caused by Eating Honey

Several of my friends like honey, but can not eat it, on account of cramps which it causes in the stomach. Is there any way to overcome this by treating the honey in some way? C. C. C.

[It is true that some persons can not eat honey; but cases of this kind are few and far between. Our impression is that the honey is not always to blame. However, some have suggested that they suffer no bad after-effects if they drink milk at the same time they eat the honey, or mix the honey and milk together.—ED.]



# Conversations with Doolittle

At Borodino, New York

## INCREASING COLONIES.

I have nineteen colonies now, and would like to increase to forty or more this year. Please tell me how to do it.

Kevil, Ky.

J. G. NANCE.

This inquiry is quite unique; for out of hundreds of letters I have received during the past ten years I have not had one of the kind; but I have received scores during that time asking how swarming could be prevented. The majority of beekeepers are looking more anxiously for a sure way to keep down increase, and more especially for something practical that requires only a little work which will do away with all desire to swarm on the part of our little pets.

[I recall that, during the season of 1873, I desired to increase twenty colonies of bees to forty, and to do it in such a way that I could at the same time get a good crop of comb honey. With this desire in mind I searched all the bee literature I could find in order to learn how I could best accomplish this; and, strange as it now seems, nearly all who mentioned this matter advised doing it by natural swarming. Nearly every writer claimed that, where only the first (or prime) swarm was allowed to issue, more honey could be obtained from the parent colony and the swarm than if no increase was allowed, as the new swarm would work with a vigor surpassing any thing that could be brought about through any non-swarming plan, or by any known means of "artificial increase;" and by using this best of all known ways, both for increase and a large yield of honey, colonies could be doubled each year, which should be enough to satisfy any reasonable person. And I concluded this was right, as, by doubling each year, my 20 colonies would reach the number of 640 in five years.

Now, if Bro. Nance is of the opinion that the best writers lived forty years ago, this plan will be just what he wants, as it will give him 38 colonies next fall, and "roll up a surplus crop greater than can be gotten in any other way." But the trouble with me was that not one colony out of my twenty would be satisfied with giving *only* the prime swarm. So the after-swarms kept issuing when I was in the hayfield, when I was at dinner, when I wanted to be at church; before breakfast, after supper, and, in the slang of to-day, "at almost any old time," until I found that the parent colony gave but little surplus. I tried all the plans given to stop after-swarming, but without success, till one night while lying awake (this lying awake nights and planning for the future is one of the symptoms of the bee fever), it came to me that no after-swarm ever issued without the piping of the first young queen that emerged from her cell; and if all queen cells were cut early the first morning after piping was heard at night, all after-swarming would be prevented. After this conclusion I soon fell asleep.

Waking refreshed, though not rid of that bee fever, I soon treated four colonies by shaking the bees from every comb in the hive and pinching every queen cell found in which I had heard piping the night before. I now watched operations. There were no further swarms, and the bees were working in the sections a week later better than new swarms would have done. This was what I practiced for the next twenty years, and I had an average yield of over 80 lbs. of comb honey from each old colony.

But Bro. Nance may prefer to have no natural swarms at all, as do the rest of us in this twentieth century; and if so, he will find the following plan of increase one of the best, detracting but little from the results of his non-swarming colonies:

When the colonies begin to grow strong in brood and bees, and before they contract the swarming fever, take two frames of emerging brood from any strong colony, or one frame from each of two colonies, putting them in an empty hive together with two frames partly filled with honey, having the two frames of brood between the frames of honey, and putting a dummy next to the comb on the vacant side of the hive. Before putting them in the empty hive, all bees should be shaken and brushed off in front of the hives from which they were taken, so that no queen will be taken from her colony. The space left vacant by thus taking these combs out is filled with frames of comb, if possible; if not, with frames of comb foundation. Now select another of the stronger colonies. Put a queen-excluder on it temporarily, and place on it the hive already prepared, having the two combs of emerging brood, which should be allowed to remain two or three hours, during which time the young bees will come up from below in sufficient numbers to care for the combs and brood.

After this the hive should be placed on the stand it is to occupy. Queens should have been previously reared, or purchased for these colonies, so that laying queens can be given them at dusk that night. A ripe queen cell will answer; but a week or more of time is lost where such cells are given. These colonies can now be built up in any way desired. I find that, if they are made a little in advance of the swarming season, as soon as the queen begins laying such colonies will build from two to four nice combs of the worker size of cells, if frames having starters are given them. But it is usually best to use frames filled with foundation. I have made colonies in this way with perfect success, clear up to the time of the blooming of buckwheat. There is no need of natural swarming for increase when we can make as many colonies as we desire in so easy a way. But such plans as these are made possible only through the advent of the queen-excluding metal.

# General Correspondence

## COMB FOUNDATION

### What Weight to Use and How to Use it

BY R. F. HOLTERMANN

Opinions as to the use of comb foundation vary greatly. To one beekeeper its use at all is deemed an extravagance; another wants full sheets everywhere; and a third, after wrestling between his own sense of what is right and his innate penny-wise-and-pound-foolish tendencies, gives the bees in the brood chamber half a sheet of foundation.

To the beginner let me say that the beekeeper who uses foundation secures straight combs of worker cells which may be used for twenty years—a very important item; and the bees are saved at least a portion of the labor of producing wax and of the honey necessary to produce the wax, because honey is to the bee in the production of wax what grass is to the cow in the production of milk; and the secretion of wax is largely a voluntary act, and to that extent unnecessary.

In Canada it is safe to say that every beekeeper who wants to feel sure of straight combs uses at least starters in his frames. A starter is vastly better than no comb foundation at all; for it is natural for the bees to get their suggestion of worker comb from the nature of the cells above. It is true that bees in cell-building often turn from worker cells to drone; but it is seldom that a comb started *drone* is changed to worker. I am not now referring to worker combs which had a hole in them, which the bees filled with drone comb. Half-sheets of foundation tend more to encourage the building of drone comb than mere starters, probably because the worker bees get the start of the queen's laying, and turn to building comb for storage purposes which, in a fast flow, means drone comb. To me it has been amply demonstrated that when starters are used there is likely to be a larger proportion of worker cells in the brood chamber than when half-sheets are used. If your pocket-book is empty, therefore, use full sheets as far as you can, and then finish up with narrow starters rather than half-sheets.

### THE EXTRACTING-SUPER.

For extracting-combs I always use full sheets of foundation, and these combs may then be used interchangeably with those in the brood chamber. There is not much of this shifting in our apiaries, yet occasionally the need is great. Again, there are occasions, if drone comb is absent in the brood chamber when the bees will prepare the drone cells in the supers for the queen, and will hold them for her to the exclusion of honey. Under such conditions there must be a lack of harmonious conditions in the hive, which more or less antagonizes the worker bees

toward the queen—a condition which it is not well to bring about.

### WEIGHT OF FOUNDATION.

The proper weight of comb foundation to use is a matter upon which there is a great variety of opinions. The make of the foundation, the wax, the climate and temperature, and the conditions under which the foundation is used, such as the strength of the colony and number of bees which cling to the foundation, room and ventilation, the support the foundation receives, all have an effect upon the resisting power of the wax and the pressure brought to bear upon it. I use a grade half way between medium and light brood foundation, and I support the sheet by means of three horizontal strands. There are those who advocate vertical wiring. I have no quarrel with such; but, in passing, I want to say such wiring necessitates a thicker and stronger bottom bar than is generally used, or a substantial stay between the top and bottom bar; and this and the other "fixings" take much more time than is worth while for me. This season I expect to run over 10,000 super combs, and the horizontal wiring is all I care to undertake. Perhaps it may be well to state right here that probably no plan embraces all the advantages.

In wiring, let us remember that, without support, the greatest strain on the foundation is on that portion of the sheet nearest the top, and the wire should be placed accordingly. For instance, to put a wire at the bottom of the sheet only prevents the sheet from sagging at the bottom; and if it stretches at all, such a wire will cause it to buckle. The upper part of the foundation bearing the greatest weight should have the greatest support from the wires used.

### HOW TO GET FOUNDATION DRAWN OUT.

A long thin sheet of comb foundation attached only at the top brings about a condition not found in nature. When the bees build comb they fasten it to the top. The sides are rounded, and the side walls of the cells are largely built out by the bees before the lower half of the comb is built. Then come the excitement and heat generated by the bees when they first cluster in the hive after swarming is over before they begin building comb. *Foundation* has to stand all these strains when the bees are hived on full sheets. The best place to draw out foundation, barring weak stocks, is in an extracting-super with a moderate honey flow, giving the bees partly drawn comb and the rest foundation. In drawing out foundation the frames should not be spread beyond the normal distance. Thus, in my twelve-frame super (for that is the hive I use), I put on one side five drawn combs, on the other side six sheets of foundation. Before this foundation is entirely built out or capped, one of the frames (now combs) is taken out, and the remaining



five combs spread to cover the space the six previously occupied; but the spreading should be done before the comb is capped.

If foundation has to be used with swarms the new swarm should be given an abundant entrance; and an entirely empty hive body under the true brood chamber is desirable for a few days. Then the hive should be shaded from the heat of the sun. At various times I have had comb foundation made from wax which came from South Africa. This, although testing chemically pure, lacked the needed strength. It appeared to me to have been damaged in rendering.

Brantford, Can.

## EARLY BROOD-REARING

### Conditions Affecting the Production of Seasonable Brood

BY LEO ELLIS GATELEY

It is a common belief that, the earlier in the spring colonies can be induced to start brood-rearing, the better they will be when the surplus season arrives. Early breeding, however, does not invariably produce such an effect; and under certain circumstances, because of vitality wasted in maintaining a brood temperature during cold weather, it frequently wears out three old bees for every new one produced. With the passing of winter on the other hand, possibly a dozen may be hatched for every one which is worn out. In view of this fact, undue stimulation of the queen at unnecessary times is a practice to be shunned.

Unless one knows just what he is going to do with the bees produced, it is impossible to have any fixed rules as to when breeding should begin. In cold weather a large amount of stores and vitality is expended in producing a small amount of brood. Moreover, bees reared in winter and early spring never live to see the main honey-flow. Any number, therefore, reared beyond the quantity required to replace those that are gradually dying off (unless needed for other purposes) will be produced at a dead loss. With a rather late flow it is certainly just as well to leave this matter to the bees. The beginner who is in doubt as to just what may be next on the calendar can, if his apiary is not in bad condition, do no better than to leave the question of early breeding entirely out of calculation.

In localities that permit of building up colonies to sufficient strength, so that increase can be made before the flow, or if bees are desired for some other equally obvious consideration, there should, with the advent of warm days, be little delay in brood-rearing activities. Conditions that permit of making considerable increase previous to the honey-flow are, perhaps, exceptional, but they exist here each spring. Again, with the exception of an exceedingly limited portion of the extreme south, a considerable percentage of the force of even healthy and prosperous colonies will usual-

ly perish during the winter from cold and old age. None of the colonies may be extra strong, and a few may be short of stores. If nearly out of stores, there will be practically no breeding done until nectar is found. When confronted by such situations the careful apiarist can sometimes do well to arouse the bees to the fact that summer is coming should they seem to be oversleeping any opportunities.

It is the colonies strong in bees and well supplied with honey that will be first to begin breeding in the spring. Of the several factors entering into the economical production of brood, the two mentioned above are unquestionably of the greatest import. The most superb example of early breeding ever coming under our observation was the case of a tall box hive of pure blacks purchased for a dollar last year. The whole front of this hive had been knocked out from top to bottom, not to speak of the cover, which consisted only of strips put on, in many places, an inch apart. The hive had passed through sun and rain during the entire winter, yet it was the strongest last spring of any colony we had ever seen at that season. A division was made in March, and in transferring the combs to a modern hive they were heavy with brood, and many drones were noticed that had been tolerated over winter. If colonies are strong and abundantly supplied with stores they will breed up in spring even under adverse circumstances.

With the coming of actual spring weather, backward colonies may be helped by the addition of young bees, and perhaps, still later, with brood. Or stimulative feeding may be practiced to advantage on days when the weather prevents the bees from foraging. The bees can also be made to move honey from one part of the hive to another by simply turning it end for end on the stand. The principal points in promoting brood production are bees, honey, warmth, a young and prolific queen; and, for fast work, a nectar and pollen supply.

Ft. Smith, Ark., Mar. 1.

### SHORT COURSES IN BEEKEEPING AT MASSACHUSETTS AGRICULTURAL COLLEGE

The annual short course in beekeeping at the Massachusetts Agricultural College is offered from May 29 to June 13, 1912, to be concluded by a convention and field day. The course and convention are under the personal direction of Dr. Burton N. Gates, in charge of the apicultural service of the College and State.

The course includes lecture, laboratory, demonstrational, apiary, and field work, as well as excursions to large apiaries and queen-rearing plants. The concluding convention should bring together a hundred or more representative apiarists of the East, besides the noted authorities and commercial men who appear on the program.

The features of this convention will be lectures, demonstrations by authorities of

national reputation, as well as displays by inventors, manufacturers, supply merchants, and queen-rearers.

A special invitation is extended to all beekeepers to display and demonstrate inventions, implements, or methods. If table space is desired, or special equipment is to be prepared, notice should be sent to Dr. Burton N. Gates, Amherst, Mass., at least two or three weeks before the convention. The College will provide covered tables for the exhibit.

It may be found necessary to limit the number of students in the course, yet applications are accepted in the order in which they are received. No registration fees will be charged. Women are cordially invited to attend.

Registration with the Extension Service, Massachusetts Agricultural College, Amherst, Mass., is necessary for admission to classes.

#### CONVENTION PROGRAM.

June 12.

Morning, 9:00. Entomology building. Displays of manufacturers and queen-rearers.

9:15. Demonstrations. Improved flexible-plate foundation-fastener. Mr. A. H. Byard, West Chesterfield, N. H.

The Aspinwall hive. Demonstrator to be announced.

The remainder of the morning will be devoted to an excursion conducted by Director Brooks of the Experiment Station for the inspection of bee-forage crops. Leave entomology building at 10:00. (If possible the trip will include a visit to a North Amherst pasture where white clover has been brought in by top dressing.)

Afternoon, 2:00. Entomology building. Addresses. Bees in relation to fruit culture and plant life. Mr. A. W. Yates, Hartford, Ct.

Subject to be announced. Mr. R. H. Holmes, Shoreham, Vt.

Demonstrations. Electric foundation fastener and wire imbedder. Mr. H. F. Davis, Holyoke, Mass.

Inventions. Mr. F. Danzenbaker, Norfolk, Va.

Adjourn to the apiary. The features of the newly erected apiary building will be explained, including the general work shop, honey-room, box extracting room, bee-cellar, and equipment.

Demonstrations at apiary. Queen-rearing. Mr. F. M. Keith, Worcester, Mass. Demonstration of treatment of infectious bee diseases. State Inspector.

Evening, 7:30. Clark Hall. Address of welcome, by Pres. K. L. Butterfield.

Address by Hon. J. Lewis Ellsworth, Secretary State Board of Agriculture.

Illustrated lecture on the life, habits, and development of the honeybee, by Dr. James P. Porter, Dean of Clark College, Worcester, Mass.

June 13.

Morning, 9:00. Entomology building. Address. The progress of apiculture in the last two years, by Mr. E. R. Root, editor GLEANINGS IN BEE CULTURE, Medina, O.

Subject and speaker to be announced. A few homely facts—things worth knowing how to do, by Mr. Arthur C. Miller, Providence, R. I.

Demonstrations. Mr. H. F. Davis, Holyoke, Mass. Electric honey-cutter for sectioning comb honey.

Demonstrations yet unannounced.

Afternoon, 2:00. Apiary. Demonstrations. Production of a swarm artificially, by Mr. E. R. Root.

Fuller queen-rearing system with completed outfit in operation, by Mr. O. F. Fuller, Blackstone, Mass.

Shook swarming, a method for the business or professional man, by Mr. H. F. Cary, Lyonsville, Mass.

Unannounced demonstrations.

## REMOVING BEES FROM WALLS OF BUILDINGS, CREVICES IN ROCKS, ETC.

### A Plan for Getting All the Bees, Including the Queen and the Honey, without Mutilating the Building.

BY GEO. W. RICH

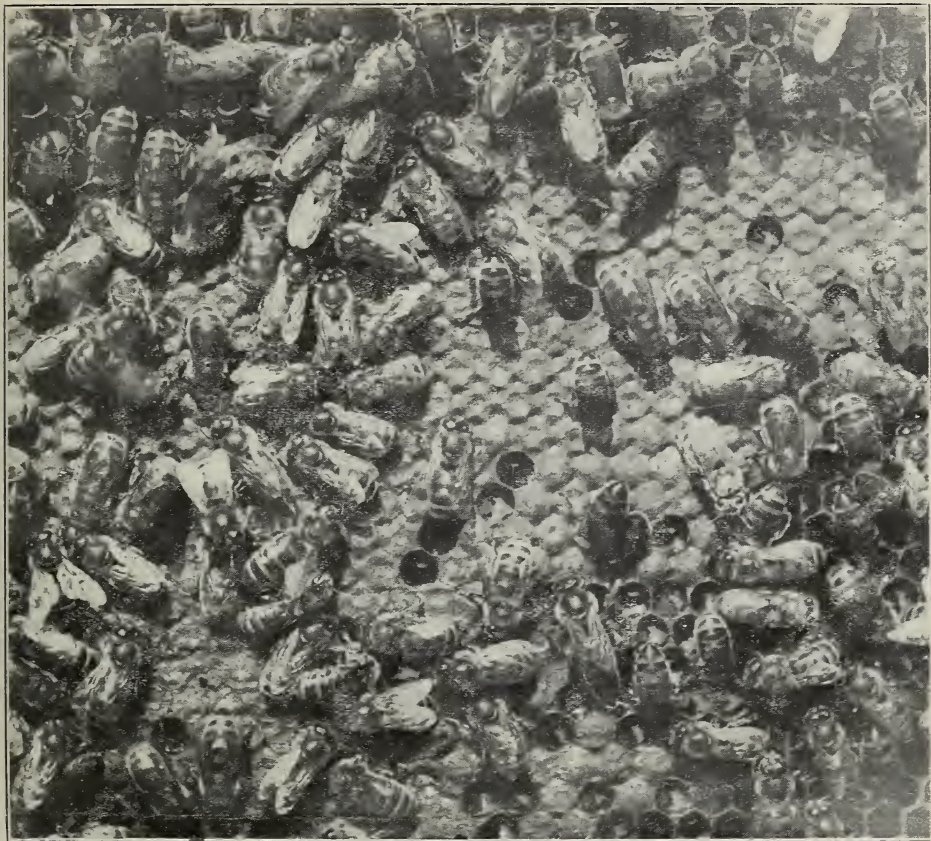
A few years ago I read of a plan for taking a colony of bees out of a building without damaging the wall in any way. The idea was to place honey close by; and, when the bees were excited, a bee-escape was placed over the entrance, the supposition being that, because part of the bees were outside, the rest would come out to join them, so that, before long, nearly all the bees would come out. Then all that was necessary was to put them in a hive containing comb, some of which contained larvæ and brood. In a day or two the bee-escape could be removed and the bees would "rob" the honey from their old combs and store it in the hive.

This plan seemed very easy, and I was anxious to try it; but I never had an opportunity until I came to California, where I found many colonies of bees in the cliffs and rocks, in squirrel-holes, etc. I have removed thirty-five or forty colonies this winter, most of them from crevices in rocks. In some cases I have secured as much as 100 pounds of honey. This is often hard work, as some colonies are in places that are difficult to reach. But there is considerable excitement and fun attached to it, which I enjoy.

Sometimes the entrances to the cavities are two or three feet across, and often the combs are so far back that one can not reach them. To help out in such cases I prepared a framework out of half-inch lumber about 2x3 feet, having a hole in the center 5x7 inches. Around the outside of this frame I tacked burlap a foot or two wide so that, if the whole thing is set in front of the entrance, the cloth will fill up the space where bees might get in or out. With this in position the bees have to fly through the opening in the center. In a board that just fitted this opening I cut a hole 3½ inches in diameter, over which I tacked a funnel or cone made of wire cloth 3 inches high, the hole at the outer end being made with a pencil, so it is just large enough for one bee to escape at a time. An ordinary bee-escape will not do, as it shuts out the light.

A quart bottle containing honey and water (about equal parts of each), a hive filled with combs, one of which has some larvæ, brood, and a few bees, and a smoker, the fuel in which has been sprinkled with crude carbolic acid, completes the equipment. On some warm day, adjust the frame in the opening of the crevice containing the colony in such a position that the hole in the center is just about where the bees go in and out. Arrange the burlap around the outside so that no bees can pass in or out except through this entrance.





Can you find the queen?—Photo by H. C. Short, Winchester, O.

With the bottle, sprinkle a little honey and water inside the frame in order to start the bees, then put some on the outside. When they are working well outside, put the board containing the wire-cloth cone in place, and soon about a third of the colony will be outside. Then place the hive so that the entrance is close to the bees, and get them started in. When all are inside, take off the board containing the cone; throw more honey and water back as far as possible in the crevice, then put the cone back in position. By repeating in this way the second time, at least three-fourths of the colony will have come out; and, when they are all in the hive, fasten it up and take every thing away from the opening into the crevice. Light the smoker containing the carbolized fuel, and blow smoke as far back as possible, using a piece of hose in order to get the force of the smoke far enough back if necessary. In every case this will drive out the rest of the bees, including the queen; but she will not come out until most of the bees have left. As soon as the queen is in the hive, close the entrance to the crevice of the rock tightly to prevent any bees from getting in. In a

day or two open it again; and if a little honey is thrown inside, the bees will soon begin to carry all of the honey from the old combs into the hive.

Simi, Cal.

### BEES ON COMB PHOTOGRAPHED

BY H. C. SHORT

This photograph of bees on a comb was taken during the fall honey flow when every available cell was crowded with honey. Most of the bees ran around on the shaded side of the comb while the camera was being focused.

The queen found an empty cell and laid an egg in it while I was getting ready. I waited patiently, but she would not do it again. I shall try again next year and hope to have better success.

Winchester, O.

[We know by experience how difficult it is to get a good picture of bees on a comb, and we wish to say that our correspondent has done a splendid piece of work in producing this picture. Can you find the queen?—Ed.]



An apiary of 11 colonies near Cincinnati that produced  $2\frac{1}{2}$  barrels of honey last year.

## BEEKEEPING AROUND CINCINNATI

BY REV. E. R. WAGNER

Cincinnati is no mean city, even if it is divided by rivers and an imaginary State line. We are not very far from the center of population of the United States nor from the center of the bee business. Here Mr. C. F. Muth originated his famous roof apiary. He loved bees so much that he kept them next to his sleeping-room. Hamilton, O., is just twenty miles away, where Rev. L. L. Langstroth lived, reasoned, experimented, and wrote; and sixty miles away his sacred ashes rest in Woodland Cemetery, Dayton.

In regard to bee forage, I believe we are most favorably situated. The many little valleys running into the Ohio River; the marshes, the steep hillsides, many covered with nectar-yielding trees, and at the same time yellow clover, sweet clover, white clover, smartweed, wild cucumber, etc., making our territory almost a paradise for the real lover of bees.

Cincinnati, O.

## SWEET CLOVER ON WASTE LAND

BY HENRY REDDERT

Since the appearance of the article on the distribution of sweet-clover seed to the members of our association, Dec. 1, p. 726, I have received several inquiries from ranch-owners

in the West regarding the advisability of cultivating the land before sowing, and asking whether it grows on hard black land or sandy or hillside country. For the benefit of others interested, as I can not answer all personally, I submit the following:

Sweet clover will grow in almost any locality where there is plenty of sunshine and an occasional rain. Indeed, most of the sweet clover thriving around Cincinnati grows on the slopes of hills and on railroad banks, along creeks, on the dusty roadsides, and in every nook where no one ever thinks of planting any thing. Even among rocks, or the ledges of stone-quarries, sweet clover makes its appearance.

It needs no further cultivation before or after the seed is sown, providing the sowing is done after a shower of rain to give it the impetus to germinate. It should be sown in the fall of the year—in August or September. When the seed-pods become dry and open up, nature will do its work. The September winds spread it broadcast; and after once taking root it sows itself at a surprising rate on rocky hillsides. It will make its appearance the next year graded down to such an extent as to expose the yellow loam that would not nourish any other crop without fertilizer; and in spots where underbrush or trees have been cleared away it will be found blooming the next season.

Sweet clover is a hardy plant; and after once taking root it can stand a long drouth. During the hot summer days when in full



bloom, the thermometer ranging from 107 to 110 degrees in the sun, the hum of the bees when working on sweet clover sounds like an electric motor. Its roots will penetrate the ground to a depth of between 3 and 4 feet. Indeed, it is known to have cast its shaft 8 feet in order to get water.

#### SWEET CLOVER AN IMPORTED PLANT.

Fifty years ago progressive beekeepers of this city imported the seed from Europe, and sowed it on what was later known as Brown Street Hill. From here it spread over the entire Mill Creek Valley; thence to Kentucky and Indiana, and now we meet it wherever it has an opportunity to gain a foothold. Along country roads it grows close up to the wagon-tracks. It even seems to thrive on the dust stirred up by the travel on the highway. Along fences where the soil has never been touched by the plow or cultivator it forms a veritable hedge of snow-white flowers during full bloom. Who cultivated all this vast region? Only the hand of nature.

#### AS AN AGENCY IN SOIL FERTILIZATION.

If sown on cultivated land for a few years, and plowed under, it furnishes sufficient fertilization for other crops. The proof of this is seen on our hillsides, the soil being black from 15 to 18 inches. Wherever sweet clover has been abundant, this soil in most places is only the cover of some stone-quarry. Our farmers should try it in order to convince themselves.

#### AS FOOD FOR CATTLE.

When young it furnishes excellent food for cattle to browse on. No matter how often cut short before bloom, when the time comes it blooms just the same. This we observed along railroad lines, the men mowing it short in order to prevent its hanging over the tracks. It seems that sweet clover has not been appreciated as much as it should be, especially by our farmers; but the day will come when it will be recognized.

Cincinnati, O.

[From the way the various experiment stations are becoming interested, we believe the value of sweet clover is already recognized. —ED.]

#### HAND'S SWITCH BOTTOM-BOARD IN THE TREATMENT OF FOUL BROOD

BY J. B. HOLSINGER

I have been interested in bees from boyhood, and have kept a few colonies as a side line since 1875, partly as a means of obtaining outdoor exercise, having worked at a watch-maker's bench for over thirty years. In the fall of 1909 I discovered signs of American foul brood in some of the colonies. The following June I found three colonies that were affected. One was successfully treated by the Baldrige method, and the other two I shook on starters of foundation, and four days later gave full sheets, but the disease



Sweet clover in the valleys running into the Ohio River near Cincinnati.



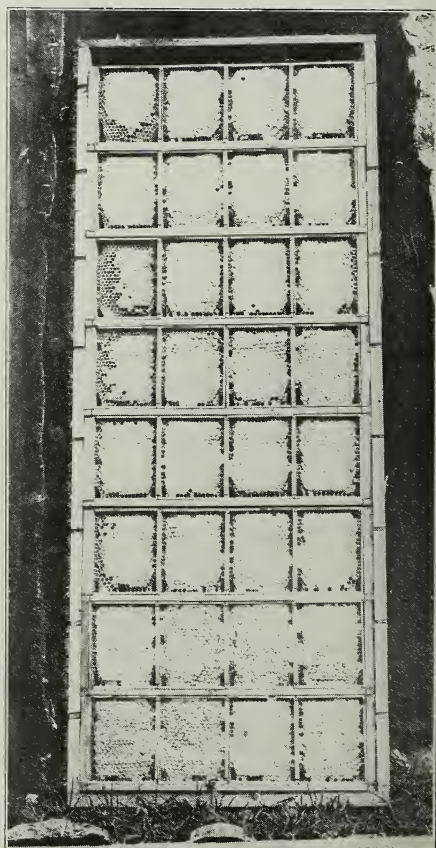


J. B. Holsinger's apiary in the outskirts of Johnstown, Pa.

reappeared in the fall, and in the spring I found both colonies affected, and treated them as follows, from ideas I got from J. E. Hand and Geo. M. Steele.

On June 20 I set one colony on top of the other on one end of Hand's switch bottom-board, and took both queens away. On the other end of the switch bottom-board I placed a wood-and-zinc queen-excluder, and on this a hive with full sheets of foundation in frames. I then shifted the switch lever; and when a goodly number of bees were in the new hive I ran one of the queens in at the top and put two tubes, 8 inches long, back of the lever, with holes large enough for drones to pass; but they became clogged with drones that the bees were removing, so I removed the tubes and used a Porter bee-escape instead, which worked all right. I removed the queen-excluder from under the hive after four days, and soon had a powerful colony of bees in the new hive, with a good-sized swarm hanging out until I opened the side entrance. I am not sure, however, that the queen-excluder was necessary. Four days later I put on the first super, and a week later I put on a super that was well started by one of the colonies before treatment. This was rather risky; but as the honey-flow was good I think it is all right, as up to Oct. 20 there were no signs of disease. About 30 days after treatment I removed the diseased hive and used a little sulphur to destroy the few remaining bees, when the combs were destroyed and the frames boiled in a strong solution of concentrated lye and rinsed in hot water, which made them like new.

From this colony I took 153 well-filled sections of honey. I am so well pleased with the switch bottom-board that I expect to use it on each stand another season. I am aware that some make light of this use-



Super of honey taken off early in September.



ful invention; but if I can get rid of foul brood and still get a good crop of honey with so little manipulation, I shall be satisfied. I started in the spring with 16 colonies, and increased to 27. From 13 colonies I took 729 sections of honey as follows from each: 153, 70, 53, 53, 52, 50, 47, 47, 42, 30, 28, 27, 26. I keep my bees at the outskirts of the city, one mile by electric, and a half-mile walk brings me to them.

#### ROBBING OUT PARTLY FILLED SECTIONS.

I have been using a method for cleaning up partly filled sections that works very well and there is no danger of spreading disease. When the last super is removed, take out all good sections and put back on the same hive the super with the partly filled sections. In about a week after this, place a pepper-box feeder, containing half and half sugar and water, over the bee-escape hole. When the bees get nicely at work on the feeder, uncup the honey and move the feeder a little to one side. The bees will enter the super and remove the honey.

Johnstown, Pa.

#### AN ENTRANCE SHADE-BOARD

BY C. E. ADAMS

I am using a shade-board that I believe is a little better than any thing that has been described. It is shown in the accompanying engraving, the second hive from the front on the right having one in position over the entrance. It can be made of very light cheap stuff, and yet can not be blown away if it is firmly braced.

The covers on these hives belong to the winter cases, and they give excellent results as shade for the upper part of the hive.



Entrance shade-board used by C. E. Adams, Exeter, N. Y.

I have also a wintering device and feeder combined that has proven very handy. Two of them are shown on the box at the further end of the picture. A shallow tray holding about a quart of syrup is in the center of the box, and is surrounded by packing material. The whole thing is about the size of a ten-frame super, being 16x20 inches outside dimensions, and about 6 inches deep. With this protection over the brood-chamber in the spring I can feed earlier and with less bother than with any other feeder I have ever seen.

-Exeter, N. H.

#### CHARACTERISTICS OF THE CROSSES BETWEEN ITALIANS AND CAUCASIANS

BY J. J. WILDER

In my previous article, page 455, August 1, I endeavored to show that Caucasian bees are not only equal to Italians as honey-gatherers, but that, under certain conditions, and at certain times, they are superior in this respect.

Caucasians are great propolizers, and they build considerable burr and brace comb, and for these reasons some feared that they would not be of much commercial value. Now, it is true that these are serious objections, and one could hardly be blamed for condemning the bees on this account. However, it occurred to me that, since the Italians do not propolize to any great extent, and build but little brace-comb, a cross might tend to eliminate these bad features. Black bees are not prolific enough to suit me, and the Italians are not satisfactory for several reasons. Hence I began crossing the Italians and Caucasians, and by selection succeeded in getting a strain that is far more satisfactory than either of the two races in their purity.

#### CHARACTERISTICS OF THE CROSSES.

As a rule, pure Italians do not build up fast enough in the early spring; and not until some nectar is coming in do they make rapid progress in rearing brood. Then if the honey-flow happens to be heavy and of short duration they are slow at storing. This is not true with the Caucasians and their crosses, for they spread brood rapidly in the spring, and keep the brood-nest compact besides, so that, by the time the honey-flow comes on, their hives are boiling over with bees ready for the harvest. They do not start off with a rush, and later become



M. D. Price among his 220 colonies, all in hives made of redwood lumber.

lazy, but they keep up in point of industry throughout the season.

My experience has been that, under severe test, while Italian bees disappear in great numbers, the Caucasians hold their own.

#### DO CAUCASIAN BEES BUILD UP TOO SOON IN THE SPRING?

Some have said that they do not want Caucasians because they build up so rapidly in the early spring and consume all their stores before the honey-flow which comes later. I have not found this to be true. In the late fall they follow the queen closely with honey, and, as a rule, they go into winter quarters much heavier than do the Italians. On this account they have ample stores next spring to last until the honey-flow.

#### CAUCASIANS DO NOT CAP THIN HONEY.

Here in the South we have a good deal of thin honey from various sources; and before it is thoroughly ripened the Italians cap it and then it begins to ferment, giving it a wet greasy appearance. This is not true of the Caucasians, for they keep such thin honey spread out in the comb, and they are very slow to cap it. When it is thoroughly ripened, however, and finished, it has a beautiful appearance and fine flavor, so that it brings the highest market prices.

#### ABOUT THE TENDENCY TO SWARM.

Mr. Frank Benton, the importer of the Caucasian bees, stated that they swarm con-

siderably, and the A. I. Root Company made the same statement after giving the bees a limited trial. But, if I mistake not, Mr. Benton explained that the cause of the excessive swarming is because they are so often kept in small hives in the country from which they came. I think this must have been true; for the first two or three years I kept these bees they would send out very small swarms, hardly worth hiving, except when several clusters went together. Such swarms came from very large colonies, too, from which much larger swarms were expected. Such small swarms were hardly missed from the parent colony, and the work in the supers was changed very little.

I have been trying to eliminate this inclination to swarm by breeding, but have not fully succeeded; for once in a great while they will swarm, although not enough to make necessary any of the usual preventives except providing ventilation and plenty of room.

The late R. W. Herlong, of Fort White, Florida, whom I referred to in my article on page 763, Dec. 15, as having had considerable experience with these bees, stated that he had had practically no swarming. Mr. W. F. Williamson, of Arabi, Ga., has a large Caucasian apiary, and has never had a swarm, although he has harvested good crops.

#### SOME MINOR POINTS OF SUPERIORITY.

These bees build more queen-cells, and larger ones. Their queens are more uniform in size. The bees are gentler than the aver-



age Italians. They always have plenty of drones. They are less inclined to rob. They supersede their queens readily and oftener. Fewer colonies become queenless. The colonies are more uniform in strength. They enter the supers more readily. Queenless colonies and nuclei accept queens from ripe cells more readily. The bees build up faster when it comes to dividing and making artificial increase.

Cordele, Ga.

## A WESTERN APIARY IN WINTER QUARTERS

BY M. D. PRICE

On the front covers of GLEANINGS we have been having a number of views of eastern apiaries in winter quarters. I am sending you a view of my apiary in California that was taken two days before Christmas.

The large piles of frames are some old ones that I discarded. I bought my apiary of a party here whose hives were 18 inches long and 10 deep, so I got rid of them, for I wanted to use hives of Langstroth dimensions. These I like better in every way.

One of the views shows a cluster of manzanita. This commences to bloom the last week in December, and is valuable, because it allows the bees to breed up early. There is very little surplus from it; but the honey is water-white whenever there is enough to extract.

I have in my apiary 220 colonies which I handle all alone, except at extracting time.

I make all of my own hives and frames of redwood lumber, which does not rot as quickly as pine. Some of the hives that I bought were fifteen years old, and were as sound as a dollar, and yet had never been painted.

Arroyo Grande, Cal.

## BEEES AS BUILDERS OF FLOWERS

The Part Bumblebees have Played in the Growing of Red Clover; How Bees Pollinate the Flowers

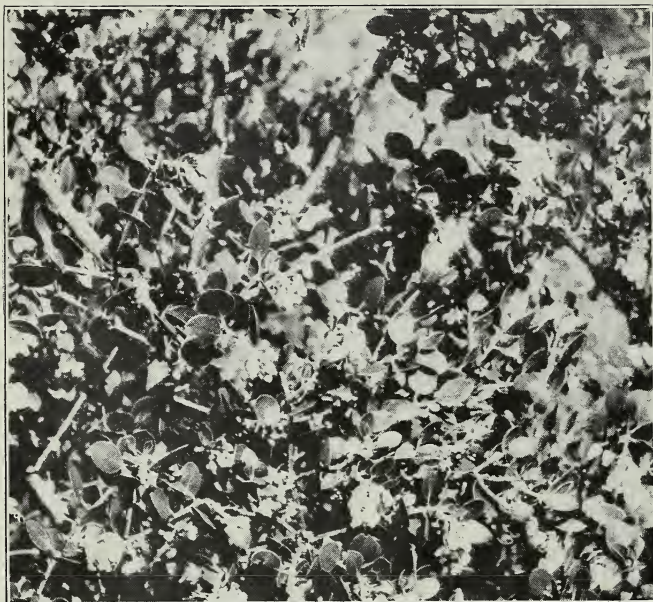
BY JOHN H. LOVELL

The English nation owes its power and wealth largely to bumblebees. This statement sounds a bit sensational, not to say improbable. But it was the opinion of a distinguished German scientist, Carl Vogt; and it is endorsed by one of the most eminent of living biologists, Ernst Hæckel, of Jena. Let us examine the evidence.

The red clover (*Trifolium pratense*) is chiefly pollinated by bumblebees, and is, therefore, called a bumblebee flower. The early settlers of New Zealand learned this to their cost. When they attempted to grow this valuable fodder plant, much to their astonishment it failed to produce seed. On inquiry it was learned that there were no bumblebees on those two large islands; but when about 100 of these bees were imported from Europe, the red clover soon became very fertile. Once introduced, the bumblebees multiplied apace, and a few years ago a letter appeared in one of the New Zealand



Typical California view, apiary of M. D. Price, Arroyo Grande, in the distance.



Manzanita blossoms which furnish honey for early brood-rearing.

papers complaining that they were becoming so numerous that they threatened to consume the nectar of all of the flowers and leave none for the domestic bee. The alarm, however, seems to have been groundless; for in 1905 the Canadian Department of Agriculture received a letter from the secretary of an agricultural association in New Zealand inquiring what species of *Bombus* pollinated the red clover in that country. Three kinds of bumblebees (*Bombus terrestris*, *B. hortorum*, and *B. hortorum* variety *Harrisellus*), descended from those imported in 1885, are stated to exist in New Zealand; but *B. terrestris*, the most abundant species, was regarded as unsuitable for clover pollination, owing to the shortness of its tongue. It was believed that the best results had not yet been obtained, and that it was desirable to introduce other and more suitable species.

According to Carl Vogt, one of the most important foundations of the wealth of England is found in the cattle, which feed principally upon red clover. "Englishmen," says Hæckel, "preserve their bodily and mental powers chiefly by making excellent meat—roast beef and beefsteak—their principal food. The English owe the superiority of their brains and minds over other nations to their excellent meat." There is no need to enter into any discussion here as to whether Hæckel's logic is sound or not, but it will hardly be denied that the production of this meat depends to a great extent upon the industrious bumblebee.

The dependence of the red clover upon bumblebees, either in this country or in Europe, is, however, not as complete as has

been assumed. It has been shown repeatedly in GLEANINGS that, under certain conditions, flowers are very freely visited by honeybees, and hundreds of pounds of red-clover honey are produced. Undoubtedly the most remarkable illustration ever recorded of the relation sustained by honeybees to the inflorescence of the red clover was given by E. R. Root in GLEANINGS for 1906, Aug. 1, p. 990. Near his north beeyard there were several fields of red clover. When the farmers began cutting these fields, the cutter-knives of the mowers stirred up a great number of bees, which so fiercely attacked both the horses and men that it looked as though they were not going to let anybody cut off their honey supply. At the same

time, a few miles away, near his south yard there was a big field of rank clover on which scarcely a bee was to be found. Here on clover fields only two miles apart the behavior of the bees was diametrically opposite. This is explained by a difference in the rainfall of the two localities. At the north yard there had been a drouth the whole season, and the corolla tubes of the red clover were so short that the nectar was readily accessible to the bees; but at the south yard there had been plentiful rains, and the tubes were so long that the bees could not reach the nectar. Pollination is also occasionally effected by other long-tongued bees, besides those mentioned, as well as by butterflies.

Incidentally it may be added that Darwin pointed out that the number of bumblebees in England was determined by the number of cats. Mice rob bumblebees' nests, and are in turn killed by cats; consequently if there are few cats there are many mice and few bumblebees. Here Professor Huxley suggested that, as old maids are fond of cats, and usually keep one or more of these animals as pets, it depended upon them whether there should be an abundant crop of red clover or not. It is certainly a curious instance of the intimate correlation of every part of nature.

Three other genera of very common bumblebee flowers may be found in almost any old-fashioned garden. They are the larkspurs (*Delphinium*), the aconites, or monkshoods (*Aconitum*), and the columbines (*Aquilegia*). They all agree in having the nectar concealed in long spurs, or nectaries, which vary in different species. The tongues of different species of bumblebees



likewise vary in length, ranging in the workers from  $\frac{1}{16}$  to  $\frac{1}{8}$  of an inch. In the females, or queens, the tongue is still longer, and in the garden bumblebee of Europe (*Bombus hortorum*) reaches the length of  $\frac{1}{16}$  of an inch. Of our hardy perennials there are few which produce a more stately effect than the bee larkspur (*Delphinium elatum*) with its wandlike racemes of deep-blue flowers. The plant is a native of Europe, where it is pollinated by the female of the garden bumblebee, no other bee on the wing at the time it blooms having a tongue long enough to reach the nectar.

The aconites, or, as they are perhaps better known, the monkshoods, so called from the shape of the flower, are so dependent on bumblebees for pollination that this genus of plants is absent in those parts of the world where there are no bumblebees. For instance, there are no bumblebees in Africa, Arabia, Australia, or New Zealand, except those recently introduced, and in these regions there is no indigenous species of *Aconitum*.

I know of no plant cultivated for its flowers alone which manages to thrive and bloom so profusely under the most untoward conditions as the common garden columbine (*Aquilegia vulgaris*). The variously colored pendulous blossoms are great favorites with bumblebees, to which they are well adapted. Our wild columbine (*A. Canadensis*) has scarlet flowers which are yellow inside, or rarely all over, and is often visited by hummingbirds as well as by bumblebees.

As pollinators of flowers, the bees, or *Anthophila* (flower-lovers), far surpass all other insects in importance. In their adaptations for collecting nectar and pollen, in diligence, and in their mental attributes, bees stand easily in the first rank. To them more than to any other insects is due the evolution of our flora. Unlike all other flower visitors they collect pollen, and it is this habit which has gained them their pre-eminence in the floral world. The beetles, flies, and butterflies take no thought for their young except to select a suitable place in which to lay their eggs. The solitary wasps provide their nests with flies, spiders, beetles, and other insects, which by stinging they have left paralyzed and helpless or dead; while the social wasps go a step further and masticate their prey before feeding it to their young. But bees are the only insects which feed their offspring with pollen; they are thus wholly dependent upon flowers, both for food for themselves and their brood.

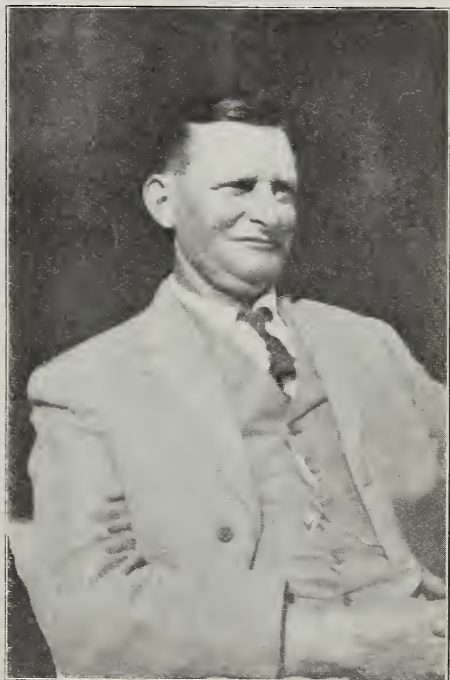
As the result of this interdependence of bees and flowers, united with the industry and mental acuteness of the former, there have been developed a great company of bright-colored blossoms which are especially adapted to their visits, and are, in consequence, called "bee flowers." They agree in having the nectar deeply concealed, where it is inaccessible to ants and other pillagers. They are often irregular in form,

as in the pea, bean, and snapdragon. The object of these odd and sometimes bizarre forms is to compel the bee to pursue a fixed path to the nectar so that pollination may be effected with greater certainty. Finally they are more often blue than any other color. So dependent are many flowers upon the visits of bees that, in their absence, they fail to produce seed. Such are the red clover, salvia, larkspur, and some orchids.

Irregular or one-sided bee flowers occur in large numbers in the violet, pea, mint, and figwort families. The species of the violet family consist chiefly of bee flowers, the general form of which is familiar to every one. One warm clear day early in May I found the round-leaved yellow violet (*Viola rotundifolia*) blooming luxuriantly beneath an old beach tree. Bumblebees, as well as smaller bees belonging to the genera *Notomada* and *Andrena*, were flitting about busily from flower to flower. On the other hand, according to my observations our wild blue violets are very sparingly visited by bees, and are often infertile. Perhaps this is the reason why many of the species, besides their showy blossoms, produce small green flowers close to the roots, which never expand but are very fruitful.

#### CLEISTOGAMIC FLOWERS.

The beautiful and richly variegated varieties of the pansy (*Viola tricolor*) have been



A. F. Wagner, El Centro, Cal., pioneer bee-keeper and bee-inspector. Mr. Wagner began 26 years ago when a boy, and has worked with bees in various parts of the country. He now has 600 colonies divided into six yards.



One of the apiaries of A. F. Wagner, El Centro, Cal.

produced partly by selection and partly by hybridization. The corolla may be pure white, yellow, red, blue, purple, or black, or there may be manifold combinations of these hues. These striking diversities result from various mixtures and modifications of two pigments contained in the epidermis—violet-colored sap and yellow granules. In the pansy the spur at the base of the lower petal contains the nectar. The anthers lie close together, forming a cone, into the center of which is shed the dry pollen; and directly in front of this cone stands the stigma, on the lower side of which there is a flexible liplike projection. To reach the nectar a bee must run its tongue through the center of the cone of anthers; and when it is withdrawn the grains of pollen cling to its moistened surface, while the lip of the stigma bends it away so that self-pollination is prevented. But when the proboscis is inserted in another flower a portion of the pollen is lodged on a receptive part of the stigma where it soon germinates.

The pea, bean, clovers, vetch, locust, and a host of leguminous allies, are grouped together in the pea family, or *Papilionaceæ*—a name derived from the Greek word for butterfly, because of a fancied resemblance of the flowers to that insect. All of the 5000 described species appear to be bee flowers, though it is claimed that a few species are butterfly flowers, and at least thirteen species are known, which, in the absence of bees, are infertile. For the most part nine of the ten stamens unite to form a tube, at the bottom of which lies the nectar, if present. Four of the petals interlock around this tube, while the fifth, called the standard, is broad and erect, and brilliantly colored to attract the attention of insects (see a flower of the sweet pea). In order to obtain the nectar, a bee rests upon the two lateral wing petals, which act as levers, braces its head against the standard, when, if it is strong enough, the keel is depressed, and it

may introduce its tongue in an opening at the base of the staminal tube. In this family the pollen is applied to the under side of the bee's body in four different ways: It may escape through a valve, or it may be pumped out or brushed out, or there may be an explosive arrangement.

But what if it is not strong enough to depress the keel? Then it does not get the nectar. Notwithstanding their beautiful hues and honeylike perfume I have never seen the flowers of the sweet

pea (*Lathyrus odoratus*) visited by bees, and this is also essentially true of the garden pea (*Pisum sativum*). Why is this? So strongly are the petals locked together that none of our bees appear able to depress the keel and obtain the nectar. Doubtless in their transatlantic home (for neither species is endemic in America) there are bees strong to push open the flower. But as both of these bee flowers are easily self-pollinated they are very prolific, even in the absence of insects.

Many of the flowers of the pea family, in fading, undergo a change in position and color. In the white clover the white central flowers contrast with an older outer ring of rose-colored flowers. In the yellow clover the newer flowers contrast with a ring of chestnut brown. In the wild vetch (*Vicia cracca*) the older flowers bend downward and turn from violet blue to dark purple, while the purple flowers of *Desmodium* become green in withering. In this way the bees are enabled to determine the older, nectarless flowers which have been pollinated, from the young flowers which have not yet been visited.

In the mint family (*Labiata*) and figwort family (*Scrophulariaceæ*) the flowers are two-lipped, and often bear a crude resemblance to the heads of reptiles and other animals, as is indicated by such common names as snapdragon, turtlehead, dragon-head, painted cup, beardtongue, and monkey flower. Many of the larger flowers are pollinated exclusively by bees, not a few being bumblebee flowers; but fly flowers and hummingbird flowers also occur. In these families the pollen, in many species, is placed on the back of the insect and not on the under side.

The brilliantly flowered snapdragon is a bumblebee flower. So firmly are the lips closed together that the smaller bees can not force them apart, and thus the nectar is protected for the rightful guests. But as



the flowers grow older, the lips often part slightly, and then the smaller bees are able to force an entrance.

Another bumblebee flower is the turtlehead, which grows along the banks of streams and in marshes. The large white flowers rudely mimic the head of a turtle. Though I have watched them for many hours and on many different occasions, I have never observed them entered by any insect except bumblebees. Sometimes a wasp (*Philanthus solivagus*) will fly from blossom to blossom, examining the lips for nectar, but it does not possess sufficient intelligence to pass between them. The mouth of the flower is so small that a bumblebee sometimes finds difficulty in entering, and flies away to another flower with a larger opening; but once inside there is an abundance of room, and I have seen one of them turn completely around within the corolla. I once placed several flower clusters of the turtlehead in a glass of water a few feet in front of a hive; but of the many bees constantly coming and going, not one of them entered a flower. But presently, notwithstanding their unusual position, the bumblebees found them, and one of them visited every flower. Why did the honeybees almost completely ignore these blossoms, while the bumblebees paid them so much attention?

It will be remembered that, in the pea family, by means of various devices the pollen was placed on the under side of the bee's body; but in the mints and figworts it is deposited more frequently upon the back of the insect. In the turtlehead the four heart-shaped anthers lie well forward in the angle formed by the sides of the upper lip. Their inner faces are applied together to form a single chamber or cavity into which the pollen, when ripe, falls. The contiguous edges are densely woolly to protect the pollen and to prevent the relative displacement of the anthers by connecting the first pair above and the first and second pairs at the sides. When a bumblebee enters the flower it spreads apart the arched filaments opening the pollen receptacle and covering the thorax with fine dry grains of pollen.

The marvelous adaptations of flowers for effecting pollination, both by their variety and ingenuity, fill us with astonishment, and occasionally they surpass the bounds of the wildest imagination. The opening, maturity, and fading of the flower, the various movements of its organs, the allurements of color, odor, and nectar, and the behavior of the insect guests, which may number from one to two hundred, afford an endless field for observation. Flowers cease to be merely bright bits of color in the landscape when we know their life histories, their rivalries and tragedies; and—yes, their comedies we see as upon the stage reflections of our own experiences. There is no more fascinating study than entering the secret chambers of these bright-hued floral edifices which adorn our fields and gardens, probing the mysteries which there confront us. But we should seek the living blossoms.

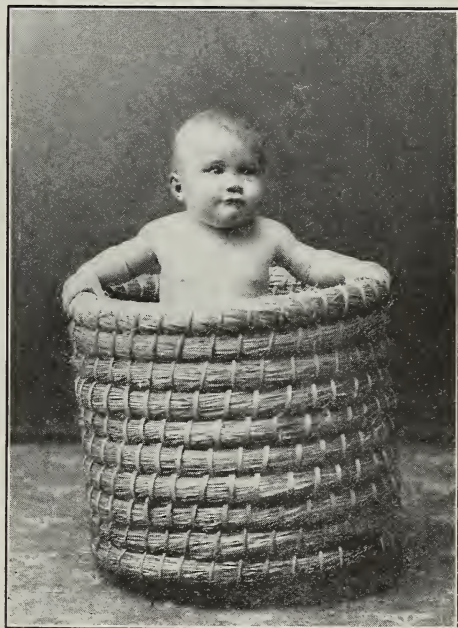
"Each one of the beautiful flower faces," says Herman Mueller, "which we were wont to marvel at with a sad feeling of resignation as so many mysteries for ever veiled now looks upon us inspiring hope, and stimulates us in friendly wise to cheerful perseverance, as if it would say, 'Only venture to come to me, and in true love make yourself acquainted with me and all my conditions of life, as intimately as you may, and I am ready to let fall the veil that hides me, and trust myself and all my secrets to you.'"

Think of all these treasures,  
Matchless works and pleasures,  
Every one a marvel, more than thought can say;  
Then think in what bright showers  
We thicken fields and bowers,  
And with what heaps of sweetness half wanton May.  
Think of the mossy forests  
By the bee birds haunted,  
And all those Amazonian plains, lone lying as enchanted.

But all bee flowers are not one-sided (*zygomorphous*). They may be funnel-formed, as in the gentians, or urn-shaped, as in the checkerberry, blueberry, and its allies, or even wheel-shaped, as in the common borage, or regularly spurred as in the garden columbine.

It is a remarkable fact that bee flowers are more often blue than any other color. Let us look at the colors of these flowers in the Northern States. Of 34 species of violets, 17 are blue, 4 blue-purple, 6 yellow, 7 white.

Of the 197 species belonging to the pea



Curt Lundgren, Stockholm, Sweden; eight months old; has never eaten common sugar. His diet has been oatmeal porridge and honey; and from his first hours his milk was diluted with honey. This is great talking evidence as to the nourishing quality in the honey.

Hartford, Ct.

ALEXANDER LUNDGREN.

family, 24 are blue, 88 blue-purple, 13 red, 33 yellow, 39 white. Of the 120 species of the mint family, 33 are blue, 47 blue-purple, 12 red, 4 yellow, 24 white. Of the 113 species of the figwort family, 28 are blue, 32 blue-purple, 7 red, 33 yellow, 13 white. As for the gentians, their blueness is proverbial, and has been well described by Bryant in his lines "To a Blue Gentian."

Blue, blue, as if the sky let fall  
A flower from its cerulean wall.

On the other hand, neither bee nor blue flowers occur in the pink and rose families. In the immense orchis family, in which bee flowers are of comparatively rare occurrence, there is only one blue flower, *Vanda coerulea*, of India. In this family red seems much easier to develop than blue. It should be added that, when two or more species of bee flowers, belonging to the same genus, blossom simultaneously in the same locality, they are frequently unlike in color, as red, white, and yellow in the clovers. This diversity of color facilitates the efforts of the bee to remain constant to one species.

If you ask me why bee flowers are so often blue, I shall be compelled to admit that I do not know with certainty. It is a problem that still awaits further study. Some naturalists say the bees prefer blue to every other color, while others claim that it is merely an incidental result correlated with the high specialization of the flower. For example, in the animal kingdom, white cats (if they have blue eyes) are nearly always deaf, but no one knows why.

Bee flowers are usually marked with spots or lines called "nectar guides," which point out the way to the nectar. In the snapdragon the palate is yellow; in the pickerelweed there are two bright-yellow spots on the middle lobe of the upper lip; in the turtlehead the white corolla has reddish lips. The flower of the hedge nettle (*Stachys erecta*) is yellowish white, with the border of the upper lip marked with two purple stripes, and the lower lip purple-spotted. The flower of the dead nettle (*Lamium album*) is large, white, or sometimes rose-colored, with the under lip pale yellow, marked with olive-colored dots; while the flowers of the hemp nettle (*Galeopsis tetrahit*), so common in waste places, is purple with a pathfinder on the lower lip of a yellow spot crossed by a network of red lines.

Finally, notwithstanding the industry and immense numbers of the honeybee, there are no flowers adapted to this species alone. Why should there be bumblebee flowers, but no honeybee flowers? Should we not rather expect the reverse? But on inquiry into the economy of the honeybee the reason is evident enough. Our domestic bee requires large quantities of stores, and in order to obtain them it must visit a great variety of flowers throughout the entire season. For this purpose a tongue of medium length is far more useful than a longer one. If the tongue is very long the nectar in open, wheelshaped flowers, like the strawberry and basswood, can be sucked

up only with difficulty and delay. To be sure, they would be able to obtain some nectar now inaccessible, as from bumblebee flowers like the red clover, or from moth flowers like the climbing honeysuckle, but this would not compensate for the disadvantages sustained. If a longer tongue would have been beneficial to the honeybee, Nature would have long since developed one. Apiarists can not improve on the tongue of the honeybee, nor can they produce a permanent strain of red-clover bees. Taken as a whole, and under all conditions, the tongue of the honeybee, as it exists, is much better adapted for the work to be done than any that can be produced by artificial selection. But there would seem to be no reason why a variety of red clover with shorter tubes should not be obtained by selection, if hybridizing with the forms with longer corollas can be prevented.

Waldoboro, Maine.

## BEEKEEPING IN BULGARIA

BY NICHOLAS CHR. BARACKOFF

It is about nine years since I first became acquainted with GLEANINGS, and since that time it has been my guide-book on bees. I am pleased with it, not only because of its teaching in all branches of beekeeping, but because of "Our Homes," which gives me much encouragement in my Christian life.

I have endeavored to spread the use of the American Langstroth hive in our country; and, although I have run against considerable opposition, I think that this hive will soon be generally used. I also do what I can toward writing about American methods for publication; and I have translated much from GLEANINGS to encourage our beekeepers.



Dimitre Pantcheff, Nicholas Chr. Barackoff,  
Dolna-Bania, Bulgaria.

All Slavic states of the Balkan Peninsula in Europe have formed a Slavic beekeepers' association which has an annual meeting every year at different capital cities of the Slavic states. The first meeting was in 1910, at the capital city of Bulgaria. The second was in Serbia, at Belgrad; and the next one, which will be in 1912, is in Rus-





One of J. C. Dickinson's yards at Valdosta, Ga.

sia, at Moskow. Among the various Slavic states, Bulgaria takes the first place in beekeeping, because our beekeepers are always ready to learn.

In the photograph, the gentleman on the left is my teacher in beekeeping, Dimitre Pantcheff, and the other is myself. Mr. Pantcheff has 250 colonies in hives of the Dadant pattern, but he intends to change them to the American hive of Langstroth dimensions.

Dolna-Bania, Bulgaria, Europe.

## ITALIANS VS. BLACKS IN GEORGIA

BY J. C. DICKINSON

In the spring of 1909 I took a severe case of bee-fever, and cured it by buying 22 hives of black bees and transferring them to Danzenbaker hives. At this time I have 56 hives of blacks and 4 Italians, 3 of which I raised myself. I gave a frame of honey and \$1.00 to a man in the city for a frame of Italian brood; placed it in a strong queenless colony, and grafted part of the queen-cells on two other frames. I made a Danzenbaker hive into three apartments; carried it back to my city friend's Italian yard, with the result named above.

My Italians produced last season four or five times as much honey as the blacks in

the same yard, although the season was a failure from a financial point of view.

Valdosta, Ga.

## BEEKEEPING IN THE CUMBERLAND MOUNTAINS OF KENTUCKY

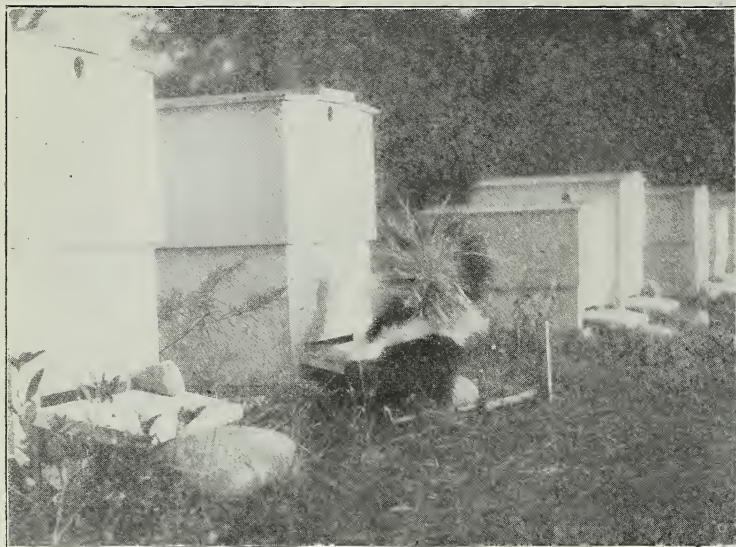
BY J. S. JOHNSON

This mountainous region seems to be an ideal place for bees. There has never been a season in my recollection when the colonies have not made stores enough for winter, so it seems strange to me to read about those who have to feed for this purpose. It is true that we do not get a large surplus oftener than once in three years; but there is always some surplus each year.

The main sources of honey are blackberry, clover, sourwood, and goldenrod. Then we have a number of other plants and trees that furnish enough nectar for bees to build up on, such as blackgum, chestnut, fruit trees, black locust, and summer heartsease.

One or all of the flowers named above will furnish nectar for the bees each season. I have never known all of them to fail in one year, and so we have more chances for a crop than beekeepers in localities having only one or two resources.

I will give a brief description of last season. The fruit bloom yielded the last of April; and just as that was over, black lo-



Skunk caught in the apiary of Carl Vollmer, Columbus, Montana.

cust began to yield; then wild blackberries, which lasted until the clover season. In the meantime sourwood, chestnuts, and sumac lasted until the middle of July, making one continued flow from April 20 until July 15. From the middle of July until the middle of August we have a dearth. Then heartsease and goldenrod last until the frost comes. I forgot to mention poplar and basswood. The former is still plentiful in the mountains; but the latter is more rare, as many of the trees have been cut down, and the stock eat the second growth, so it is fast becoming extinct in some places. Where there are still virgin forests it still abounds, but it yields only about every fifth year. The stock care less for poplar.

There are no apiaries near me except those of farmers who keep a few colonies to furnish honey for their own use. The truth is, no one in these mountains knows any thing about the inside workings of a hive. I have always delighted in bees, but never had read any thing on the subject until one day I was looking over a government pamphlet on good roads, and saw in the index an address from which I could obtain some literature.

The study of bee culture has given me a new field of thought. It seemed to me when I had read these helps that I had been asleep thirty-five or forty years; but, coming at a late hour, I have the experiences of others to profit by. After I had skimmed the whole country for literature two years ago I began the bee business with two colonies of black bees in log hives.

I now have fifteen colonies in movable frames, all Italians except one, and all full of stores gathered from the kind of goldenrod that is spoken of in the A B C as being

very rare and having silver-like flowers. One colony stored 50 lbs. of surplus from this plant, and I took it off Dec. 25. For a description of this flower see page 666, Nov. 1. In 1910 and '11 the bees gathered sufficient honey to winter on, and good colonies gave a surplus of about 30 lbs. of comb honey. The honey is of a good quality and of a golden color. There is nothing where it grows that beats it.

There is a piece of land within a mile of my apiary that was cleared only a few years ago. It is situated up the creek in a hollow to the left. In order to go straight to the field a bee must fly over a mountain; but last fall the bees followed the creek until near the mouth of the hollow, and then turned to the left, making nearly a right angle. At one point on the route there was a small knoll; and if one stood on this knoll the laden bees would strike his hat. It seems that all the bees in the yard were going to this field. If it would pay to sow any thing for the bees it would be this plant. It will grow in any soil.

I make my own hives the standard size, with eight frames. I think they suit me best, from the fact that our climate in the mountains is more moderate than in similar latitudes, because the prevailing winds are broken.

Langnau, Ky., Jan. 25.

### CAUGHT IN THE ACT.

BY CARL VOLLMER.

Early one morning last August I took a stroll through my apiary, and saw the tracks of some animal on some of the white-painted alighting-boards. Bending down to examine them more closely I was surprised to see the bees boiling out of the hive. I thought a rabbit might have hopped on the board and stirred up the bees, but wondered why he had selected such a place. Late that evening I was sitting on the porch of my cabin when I heard a scratching noise underneath. My first thought was pack-rats; but that could not be, because a large bullsnake had his camp under the house, and it would not be healthy for a mountain-



rat to make his home there. Without making any noise I reached for my rifle, and waited. Soon the digging started again, and in a few moments a sleek skunk emerged. I did not want to kill it right there, so I let it go a little way before I fired. Well, it was too dark to shoot, and I missed. The skunk started for his hole, but I headed him off. I guessed then what had been disturbing my bees, and so I set a trap in front of a hive.

The next morning I had not caught any thing; but on looking around I found tracks before some other hives. Borrowing some traps from a friend I set about half a dozen, and the other morning I found one trap sprung and a chicken leg in it. Poor biddy had gone there during the day, got caught, and the skunk had eaten her. I took up all the traps during the day and reset them at night, baiting one with the chicken leg, and in this trap I found the thief next morning. The bees in the hive were quiet; but when I got as close to the skunk with the camera as I dared he started to back up to the entrance of the hive, and the fight was on.

That fall I caught eleven skunks in front of the hives, and have had no trouble since. Skunks are easily caught, as there is no need of hiding the traps nor even baiting them, as one has to do for most other wild animals.

Columbus, Mont., July 1.

[Occasionally we hear reports of damage done by skunks. They seem to delight in scratching at the entrance, and then devouring the bees as they come out. It is seldom that any serious loss is noted, for the animals, as our correspondent states, are easily caught.—ED.]

## A START WITH BEES ON A NEW JERSEY TRUCK FARM

### A Detailed History of Some of the Mistakes Made the First Few Years

BY WILLARD B. KILLE

Beekkeeping on a large scale is a business in itself; but I believe bees can, in a limited way, be made quite profitable on many farms where at present none are kept. Many are deterred from keeping bees simply through fear of being stung; others because they know nothing of the business, and hesitate to start.

Our first experience with bees was not exactly a pleasant one. Father, believing bees beneficial, and worthy of a place on the truck farm for the purpose of pollination, purchased a colony in an old box hive. It arrived at night. While sitting around the table before bedtime, two youngsters fired questions about bees faster than a whole corps of present-day bee-experts could answer them. Among other things we learned from a story told by the hired man that "natural beekeepers" could pick up bees barehanded, and that every colony had in

it one very remarkable bee called the queen, and that she was "boss" of them all. That night in bed we boys thrashed it over and decided that we were "natural beekeepers," and that our first business the next morning would be to capture that wonderful "lady bee," or queen, and display her to the rest of the family, thus demonstrating our prowess as beekeepers, and laying claim to our fitness for taking full charge of that colony as well as its future offspring.

Thus inspired we sallied forth the next morning to execute our well-made plans. Being older I volunteered to catch the bees in groups of five or six as they emerged, and to pass them to my brother, who was to examine them and locate the queen. But, alas for worthy motives and well-laid plans! I caught the bees. How many, I don't know—neither does my brother. He stopped neither to count nor console, but rushed pellmell to the house and hid well away from the bees, from my own howlings, and from mother's scoldings. It was a sad experience. That house held two wiser and more thoughtful boys. But it taught its lesson.

After that experience we felt perfectly willing to let father be beekeeper. We were interested at swarming time when he hived the new swarms in boxes similar to the old. We were also on hand with good appetites when any surplus honey was secured. However, the quantity was usually so small we felt but little sorrow when the bees got what my father called a "case of millers," and died, although at the time I failed to see why the bees did not drive the millers away by treating them as they did me.

The millers did good work—not one of father's colonies survived; yet there was no talk of securing more to replace them until about four years ago when all the bees in the neighborhood seemed to have contracted "the millers" and died. Then we noticed that our cantaloupes, watermelons, cucumbers, squashes, etc., were not setting fruit as they did formerly. We also observed that bees were seldom if ever seen working in the blossoms of these and other vegetables, while formerly the fields had been full. These facts made evident the necessity of having bees in the immediate neighborhood, so we determined to try again.

This time my brother, then in grammar school, having read in a farm paper that some people were making honey from the sale of honey, and also having partially forgotten his former experience, which was not as painful as my own, he determined to buy some bees; and to make them profitable, not only as pollinizers but as honey gatherers. He did not buy any, for our uncle, who had three colonies in box hives, presented him with a colony. This was placed on a stand of four bricks in an out-of-the-way place under a peach tree. Then he bored four holes down through the top of the hive and covered them with a weighted board. All was done on a cold day, when bees were not flying. He also made an 8x10-inch box. He

planned to remove the board covering the holes in the top of the hive as soon as honey began to come in, and place this 8×10 box over it to be filled with honey.

This was in the winter of 1907. My brother was a freshman in high school. I went to New Brunswick to take a short course in agriculture, and there something happened. We had special illustrated lectures on Saturday mornings. Two of these were on bees and beekeeping, and were delivered by Dr. D. Everett Lyon. Previous to this I had known in a general way that bees were sometimes kept in patent hives, and that there were a few people making a living from bees; but I had no idea of the size of the business nor of its vast possibilities. In fact, I had no knowledge at all of modern methods as practiced by our best beekeepers. To say that I was surprised at some of the statements and views during those two lectures would be putting it mildly. There were views of modern dovetailed hives filled with frames, and showing how they could be lifted out and examined while the bees were on them; neat supers to take the place of the old-fashioned top boxes filled with honey in one-pound sections—just the right size for table use; machines that would throw the honey from the combs, and leave it to be drawn off as a clear clean fluid free from wax particles; the different breeds of bees, and comparisons showing wherein the Italians were superior to the black bees; and also the buildings, hives, and apiaries containing hundreds of colonies of bees belonging to many successful beekeepers. These things were highly interesting, and I began to think of what might be done with my brother's colony, when some more views were shown illustrating bee demonstrations. The things those people did with bees was certainly marvelous. I considered that it would simply be suicide to attempt those things. To put it honestly, I fear I did not believe Dr. Lyon's statements concerning those demonstrations, even though he is, I believe, a minister of the gospel.

I came home in the spring, told my brother what I had seen and heard, and got him interested to the extent of sending for the A B C book. Father laughed at the idea of spending money for a book on bees; but when it came his ridicule was changed to wonderment that so much could be written about so small a thing as a bee. "Why," he said, in speaking of it to a neighbor, "it's a regular encyclopedia; and to think it's *all* about bees! Why, if those boys master all the things in that book they won't need to keep bees or farm either; they'll be scientists." We are not yet scientists, but that book was gone over and studied, especially by my brother, at every spare moment. So also was GLEANINGS, for which he soon subscribed.

When reading we found some things, in the light of our previous knowledge and experience, quite hard to believe. After making due allowance for exaggerated statements we still found that a surplus of 50 or

75 pounds of honey per colony was not considered a heavy yield at all; yet no one in our own neighborhood had ever seen such yields from box hives. Where was the fault? Was it the fault of the box hives, the bees, or the beekeeper? We determined to find out; if necessary, by experience. By making a start in a small way, there would be little to lose and much to gain in experience and knowledge if not in money; so an order was sent in for an eight-frame 1½-story hive suitable for comb honey. It was ordered nailed and painted, and was fitted with 4¼×4¼×1½ plain sections with foundation starters. An examination upon its arrival convinced us we did exactly right in ordering our first hive already nailed together, rather than purchasing in the flat and nailing the parts ourselves.

This was in the spring of 1908. My brother's colony in the box hive was in good condition. At his request I bought a half interest in that and we went into partnership.

When the trees began to bloom the bees flew out in constantly increasing numbers, and my brother expected to see a swarm each night on coming from school. We were all given special instructions to leave the swarm until after school for him to hive. Well, one hot day at noon out came the swarm—a big one too. It settled on a tree near the ground, and would have been quite easy to hive, but we left it as instructed. Our orders are now quite different. From that day they have been to hive swarms on the jump; for when he came home from school that night no bees were to be seen. Together we searched every tree, crack, and corner on the farm, but never located that swarm. It "lit out" for good.

Some days after our swarm left, our uncle had a swarm settle in a tree; and as he did not care to hive it himself, he gave it to us. The new hive was taken to the tree; and after much difficulty, but no stings, for we were as well protected as the average Egyptian mummy, the swarm was safely hived. But, alas! those bees had not been properly reared, and did not recognize the advantages of their new home fitted with all modern conveniences. They absconded without even leaving their next postoffice address. However they failed to pay for their night's lodging, so my brother and myself felt it to our best interests to locate them. We found them some distance away in another tree. The hiving process was repeated. This time they became permanent lodgers, and stood the trip home to our own yard successfully.

My brother's box hive cast a small after swarm that behaved better than the first, and was housed in a box hive. The bees in the box hives were left severely alone except for putting a top box on the parent hive. But we resolved that the work of the bees in the new hive should be watched, the bees themselves studied, and that we should learn to examine or manipulate them as outlined in the books.

The new hive was opened the first time with great fear and trembling. We had no



smoker, but no one could have been more completely covered and protected. Two thicknesses of mosquito netting around our faces, heavy coats and trousers with sleeves and legs tied down, and with thick hoghide gloves to protect our hands—even with such protection I am afraid I stood quite a distance away when the cover was removed; but after my brother had taken out a couple of frames without serious results I became more bold, and was soon as much interested in the work going on inside the hive as he. It was about three weeks since the swarm had been hived. The amount of work they had done was surprising; but the most interesting of all was to see with our own eyes the eggs, young bees, pollen, the life, the hustle, and other things that had before been pictured only in our mind's eye or on the pages of a bee book. This one glimpse of the workings of the bees inside their home more than repaid us for our work and the cost of the hive, but it did not stop there by any means.

Having survived to tell of one manipulation we found it a less hazardous undertaking to make the second, and it became increasingly less each time.

We found the heavy coats, trousers, and gloves unnecessary. A piece of netting was used over our heads so that an occasional jab might not make us unpresentable for Sunday-school—that was all. On the second examination we were fortunate enough to get a glimpse of the queen; and after that we found the hitherto unbelievable feat of locating the queen not difficult at all.

In the fall, when we removed the upper story or super from that hive we had 24 sections of honey each, filled clear out to the edge. This wasn't like the yields we had read about, but we were pleased with it nevertheless. And, besides, it paid for our hive. We gave away four sections, and sold the rest for \$3.50. Our hive, together with expressage, cost \$3.25, so we gained 25 cents and some experience besides. The box hive gave us about 6 pounds of surplus honey. This was consumed at home. Altogether the year's experience strengthened our thirst for more knowledge on beekeeping lines, and demonstrated to our complete satisfaction the great advantage of having bees in frame hives rather than in the old-fashioned box hives.

The next year, 1910, we purchased in the spring five 1½-story hives in the flat; smoker, bee escape, and one Italian queen. This was followed in the fall by five more 1½-story hives, 100 sections, and 5 supers for use in 1911. All were paid for, however, in 1910, making a total of \$32.75 spent in bee supplies. The lessons we learned in beekeeping were valuable, and I presume they were practically the same as are common to every beginner. The fall inventory showed that we had six colonies of bees in frame hives (one of these Italians), and two in box hives. The honey yield, due to many causes, chief of which was our own blundering, was only 50 pounds. The highest from

any colony was 24 sections. We sold 41 sections and received \$7.17. This reduced our indebtedness to \$25.58, and we had five empty hives and sixteen supers for use the next season.

This year, 1911, was really the most interesting of all. Having an opportunity to secure seven colonies of bees in box hives at \$1.00 each we bought and actually transferred the bees from five of them to frame hives. We managed it so successfully that I no longer harbor any doubts as to the truthfulness of the statements Dr. Lyon made.

We had but one swarm, and that was in late summer, and was caused by not giving our Italian colony enough room. The queen we had purchased left with almost all the bees, and could not be located. It was a big loss, for we were expecting much from that colony; and its work earlier in the season justified our expectations. But, like many other experiences, it was needed to teach a lesson. The superior work of that one Italian colony, together with their gentleness, induced us to get more Italian queens. Eight were bought and introduced, but not all successfully. There were many experiments and blunders throughout the entire season, but in spite of the blunders we had honey too. One of our Italian colonies with a queen which was introduced in July gave a surplus of 75 pounds. With that as a starter we feel as though we might be able with more experience to get yields some time that will at least half way approach some of those we have read about.

Our expense this season for queens, box hives, and incidentals, was \$18.78, which, added to our indebtedness of \$25.58, left from 1911, made \$44.36. Our sales of honey and beeswax sold direct to consumers amounted to \$57.00. This leaves a balance of \$12.24 in money; and a present inventory shows that we have 11 colonies of bees in frame hives, 9 of them Italians; 3 colonies in box hives; all, with the exception of one box hive, going into winter in good shape, besides 16 supers, several sections, smoker, hive tools, etc., that have all been bought and paid for by the bees themselves.

No estimate can be placed on the value of work and study with the bees. It has all been done at odd times; and, speaking for myself, I can say that it has been a means of recreation and rest from the hustle and hurry that is essentially a part of every truck farm. For my brother in school it gives just the one thing needed to keep up an interest in things outside the schoolroom; and who knows but the bees may do their full share in paying his way through college? Stranger things have happened. However that may be, we have both developed a case of bee fever that refuses to be cured; and if we plan better things for the future it is because we have much faith in that future.

Swedesboro, N. J.

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Pyrox fills the barrel with the apples that used to be on top. Write BOWKER INSECTICIDE CO., Boston, for book.

## AN ABNORMAL QUEEN BEE

BY JAS. A. NELSON, PH. D.

I send you by this mail a queen. Very strangely, she is half queen and half drone. I have never seen such a queen, and I have never read of one. I will also send you the cell in which she was hatched. She was hatched in 18 days after the colony became queenless; but I do not know the age of the queen that produced her, at the time I took her from the hive. I was sick last June, and my domestic took away the frame to which the cell was attached. If it had been myself I would have written. It was on drone comb. I do not know what will be your explanation of such a thing. I have never seen a livelier queen.

REV. A. FRANCOIS, Dominica, B. W. I.

The queen referred to in this letter was sent to the Bureau of Entomology; and when received she was alive, and appeared to be in good condition. It was planned to introduce her into a colony to test her fertility, but she perished by an accident before this could be carried out. A careful examination of the exterior of the dead queen showed nothing abnormal or unusual in the structure of the head, thorax, or appendages.

The abdomen, however, was of a very unusual shape. Instead of the long tapering conical form characteristic of the normal queen (Fig. 1 D), it was in this case broadly ovate, as Figs. 1 A and C show. Moreover, the three last segments were bent strongly downward so that the outline of the abdomen suggests that of the drone, having a blunt apex, and doubtless was the cause of Father Francois' supposition that this bee was hermaphroditic (having both male and female reproductive organs). A more careful examination of the abdomen disclosed further abnormalities. In correlation with the unusual breadth of the abdomen, the sternites of the 5th and 6th segments are much broader than in the normal queen (Fig. 1 C). They are, moreover, somewhat asymmetrical, as is also the sternite of the 4th segment, although to a slighter degree. Most modified of all is the sternite of the 7th segment. In the normal queen (Fig. 1 B) this has approximately the outline of an isosceles triangle with a small notch at its posterior end. In the abnormal queen (Fig. 1 C) this plate is so much reduced by shortening in the longitudinal axis that it is almost completely covered and concealed by the sternite of the 6th segment. This reduction of the 7th segment in part accounts for the strong downward bend of the abdomen. In addition the posterior notch is very wide and deep, with a semi-circular outline extending over fully half of the posterior border of the segment. The sting is also slightly abnormal, having a kink about midway of its length.

An examination of the internal organs showed other and more fundamental peculiarities. The poison-glands, poison-sac, and spermatheca (Fig. 2 A) in their size and structure display no apparent abnormalities. The spermatheca was empty, indicating that the queen was a virgin. The digestive tract also seemed to be normal. The sex organs, however, were strikingly modified. The left ovary (Figs. 2 B, OvD) was present, but flattened and bent into an S-shaped curve. Attached to its upper end was a conical opaque whitish mass (Ov) 1.8 mm. in length apparently representing a single egg-tube and seemingly

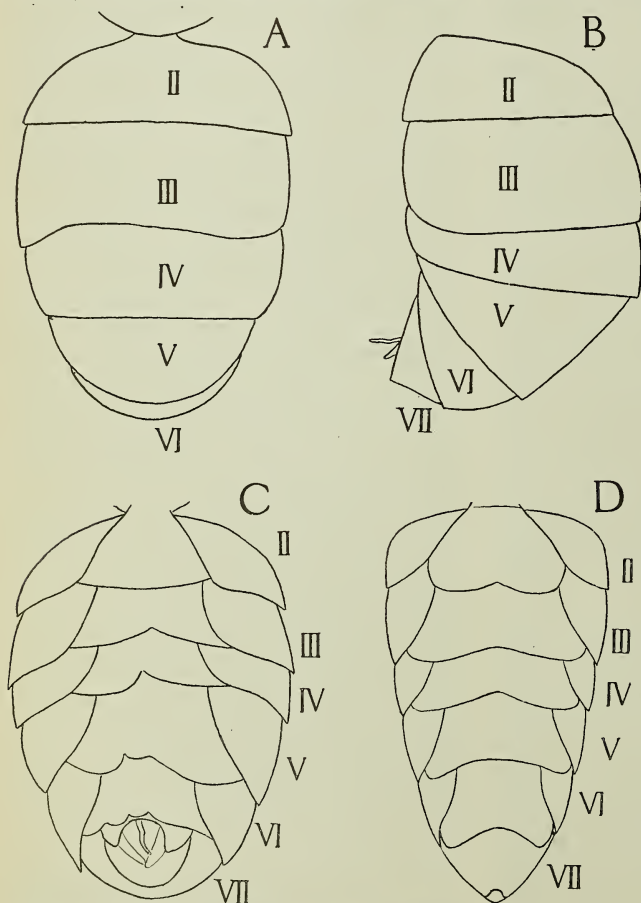


FIG. 1.—A, B, and C, dorsal, lateral, and ventral views of abdomen of abnormal queen; D, abdomen of normal queen, ventral view.



containing only a single egg. As Figs. 2 A and B show, the external openings of the poison apparatus on the one hand, and the spermatheca and vagina on the other, are

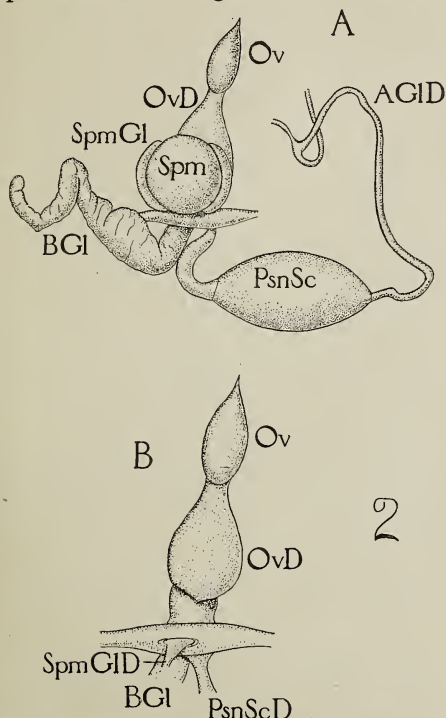


FIG. 2.—A, poison apparatus and sex organs of abnormal queen from above; B, ovary and oviduct of abnormal queen. AGID, duct of acid gland; BGI, alkaline gland; Ov, ovary; OvD, oviduct; PsnSc, poison-sac; PsnScD, duct of same; Spm, spermatheca; SpmD, duct of same.

very close together. In the normal queen this is not the case, since they are separated by a considerable interval which is taken up by the dorsal wall of the vagina. It is evident, therefore, in the case under consideration, that the vagina is very much shortened in correlation with the shortening of the sternite of the 7th abdominal segment.

The cause of the abnormalities recorded here is entirely unknown. The cell from which this queen emerged was, to all appearances, entirely normal. Moreover, these abnormalities can not be related to the sexual characters of the drone or the worker, except in so far as the reduction of the ovaries is peculiar to the worker, but in the latter case they are symmetrical. The queen is not in any way hermaphroditic, but merely abnormal in the reduction of certain parts of the abdominal wall and viscera.

Bureau of Entomology,  
Washington, D. C.

[These abnormal cases are very interesting, to say the least, for they show that even nature sometimes apparently makes mistakes.

A short time ago we received a dead bee from one of our subscribers, which had all the appearances of an undersized drone. The head was clearly not that of a worker, the eyes being the exact shape of those of a drone. However, the bee had a sting, which, though it seemed to be rather small, was nevertheless a perfect sting with poison-sac and all.—ED.]

## PROBLEMS IN CELLAR WINTERING

### House Apiaries vs. Chaff Hives

BY DR. C. C. MILLER

C. H. Gebhardt asks some questions that I will answer without repeating them.

Your cellar, where the bees are, being some distance from their summer stands, toward spring, if the bees become too uneasy, you might set them out near the cellar for a cleansing flight, then return to the cellar till time to put on their summer stands, and no harm would come of it. But if you take them out, as you say, "once in a while," there would be more likelihood that some bees would go back to the location of the cellar when set on summer stands. Better give up the idea of "once in a while." Once is enough, and that toward spring, and not then if you can keep them at all contented in the cellar.

With winter-cases over, hives you can not very well use Alexander feeders in spring. At that time it will be much better if you have saved over from the previous year combs of sealed honey, putting a comb near the brood nest, but never between two combs containing brood.

Your mating boxes containing four or five shallow extracting-frames ought to do fairly well to winter over queens in cellar, if each one is well stocked with honey and has a good force of bees.

I don't know whether your bees would fly three miles across the lake to reach those linden trees. If nothing was to be had elsewhere, they might, especially if the wind should come from that direction. I don't think you or I could smell basswood blossoms three miles away; but I suspect that bees are better smellers.

I don't know why it is that your bees did worse in your warmly built building than in chaff hives outside; but it is the usual experience, although some succeed with such buildings. I suspect, however, that the chief trouble is just because the house is so warmly built. When the temperature went down 25 degrees below zero it did not get so cold in the house as outside. On the other hand, when it went up above freezing, those same close walls kept it colder inside than outside. There was a more steady temperature in the house, making the house better in the colder times and worse when the weather moderated; and it is quite possible that the bees stand it better to be outside with the temperature ranging from 25 below to 40 above than to be in a house with the

temperature ranging from 15 below to 30 above.

You have ordered a tested queen for that queenless colony that has only two or three frames of bees; and the question is whether, by proper feeding and keeping warm, you can save it and get it strong for the harvest. May be. It is possible that it may give you the biggest yield of all your colonies. But it is a good deal more likely that neither bees nor queen will live to see the harvest. If that colony is queenless in March, most likely it was queenless long enough before it went into winter quarters so that all the bees are old, and will die off too rapidly in spite of any thing you may do. Nine times in ten—perhaps ninety-nine times in one hundred—the most profitable thing to do with a colony that goes queenless in fall or early spring is to break it up.

### SOWING SWEET-CLOVER SEED

The Unhulled Germinates Just as Quickly as the Hulled if Sown Early

BY R. L. SNODGRASS

On page 730, Dec. 1, Frank Coverdale advises sowing sweet-clover seed any time during the summer between early spring, say April 1 and the last week in July. He also claims that unhulled clover does not come up as readily as the hulled. Now, I think if he will take some of the unhulled and hulled out of the same lot or sack, and plant it, he will find that it comes up just as readily as the hulled.

My experience has been that neither one will come up the first year in time to do well unless it is sown as early as February 1 or in March, so that it may freeze a few times before it is warm enough to germinate.

If the seed is put through a good sweat before planting, or if it is stacked before thrashing, and left long enough to go through a good sweat, it will germinate very well; but the safer plan is to sow about February 1, and not before; for if sown earlier there is danger of warm weather that may bring it up, and then hard continuous freezing, which will heave it out.

At this writing we have had several days of damp rainy weather, and any amount of sweet clover has come up from the seed, only to perish. This applies to both the white and yellow (biennial) varieties.

When I cut my crop of yellow-sweet-clover seed the weather was very dry, and at least 50 or 60 pounds of seed per acre was shattered out. I then plowed up this ten-acre field and sowed to buckwheat on the 8th of August; and now with all this sweet-clover seed turned under there could scarcely a plant be found that came up, and we had plenty of rain too.

I secured from this field 40 bushels of yellow biennial-sweet-clover seed, and later 75 bushels of buckwheat, which never does very well here, and especially on thin land.

Now, I think it a good plan to plow up a

field every other year, and sow to something else. Buckwheat can be planted; and after that, winter wheat can be put in, or oats in the spring; but don't seed too heavily, as it may smother the young sweet clover in the spring. By taking this precaution, the clover does much better, grows more rank, and a more even stand is obtained. After a good thick stand, one can not expect to have a seed crop the next season, as the seed crop smothers out all the young plants; consequently it is a good plan to put in something else in the spring or fall, for both a seed and bloom crop is impossible every year. If, by using the harrow, it would come up from the seed which scatters off in the fall, then we could have a seed crop every year, and it would not be necessary to plow it under so often, but it will not.

The yellow variety comes up much earlier than the white—about the 15th of June; and the seed that scatters off that early will not come up either. I think this proves plainly that the seed has to go through a "sweat" or freeze to cause it to germinate.

If Mr. Coverdale or any one else can tell me just how I can obtain a good stand and bloom crop every year I shall be very much obliged.

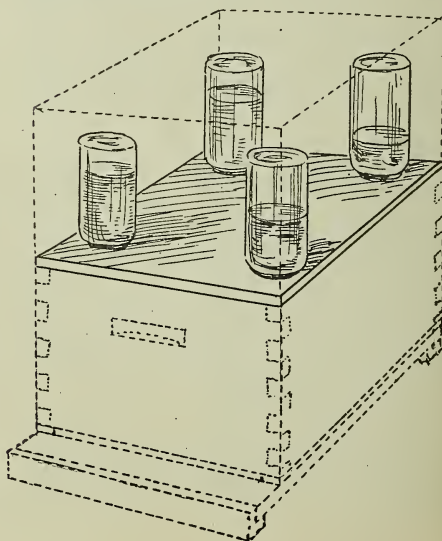
Augusta, Kansas.

### FEEDER MADE OF FOUR MASON JARS

BY FRANK BAKER

I had to do some feeding last fall, so I devised a feeder which I like very well. I took a honey-board of  $\frac{1}{2}$ -inch lumber 16x20 inches, the same size as the ten-frame hive, and cut four holes for Mason jars with perforated caps, either one or two quart. A good colony will take down four or five quarts in a night. A hive body should be set above the board to hold the jars in place, and to keep robbers away during the day.

Enid, Oklahoma.





# Heads of Grain from Different Fields

## Beekeeping in North-Central Texas

We find that that magic word "locality" has a wide and varied influence on bees and beekeeping in general. Texas is a large domain, if one will but stop to consider, with a great variety of climatic conditions. Here in the north-central part of the State we rarely have any honey-flow of much consequence until the cotton begins to bloom the latter part of June, thus giving ample time to beekeepers to get every thing in readiness for that longed-for period.

Our first pollen comes from what is locally known as swamp elm, which is now blooming, February 18. Then follows a variety of fruit bloom with wild plum, redbud, oak, alder, ash, and many other trees and vines, all furnishing more or less pollen, and some a small amount of nectar which serves to keep bees busy till the main flow begins; though seldom of late years, on account of the increased number of colonies in this locality, will this suffice to furnish enough for the necessary brood-rearing consequent on swarming. Feeding generally has to be resorted to for the best results.

However, our bees have wintered well this year, and are coming out with abundance of stores, although each colony seems a little short of bees, which probably accounts for the large amount of sealed stores on hand at present.

### COTTON-SEED MEAL A SUBSTITUTE FOR POLLEN.

We farmers feed a great amount of cotton-seed meal to our stock. This is a bi-product of the cotton-seed oil-mills—a golden-yellow flour or meal resembling the natural pollen of many plants, and is rich in nitrogenous elements. During the last few warm days my bees have been literally swarming around the shed where this meal is kept, and are carrying away great loads to their hives. There is the usual abundance of old pollen in hives near the brood-nest, as was ascertained by an examination before they located this new find. I had never noticed this before, nor have I ever read of bees utilizing such as a substitute for natural pollen; but I should think it a much better substitute than rye or wheat flour, as it is a much richer food—a chemical analysis showing the following: Protein, 48 per cent; fat, 7; crude fiber, 6; nitrogen, free extract, 24, while its fertilizing value is about as follows: Nitrogen, 7.5 per cent; phosphoric acid, 2.8; potash, 1.8. I see no reason why it should not become a comparatively cheap and valuable substitute for natural pollen in regions where there is a natural deficiency of this valuable adjunct to successful beekeeping.

Our honey in this section will, I think, compare favorably in color and quality with that of any other place, as we seldom have any amber honey, all being light, of good body, and of mild flavor. Our section honey won against all competition at the State fair at Dallas last season.

Another word as to locality. Last season I purchased, seven miles away, some bees in Danzenbaker hives with section supers. These, with scant attention, produced on one-inch starters over 100 lbs. of No. 1 white honey per colony, while my bees in the home yard, all of the same race of bees, with better attention, and run for bulk comb and extracted honey, averaged only about 25 lbs. Local showers at an opportune time is the only way I can account for this great difference, as the country is level and the honey flora is practically the same. Such experiences render beekeeping all the more fascinating, each succeeding season offering its new problems and ultimately rendering its valuable lessons.

Trenton, Texas, Feb. 18.

O. SAUNDERS.

## Transferring from Box Hives Having Sloping Bottom-boards

I have a problem in transferring that I should like to submit. I have nine colonies in box hives that I wish to transfer in the spring into movable-frame hives; and instead of resting on loose horizontal bottom-boards at right angles to the hive bodies they have their bottom-boards nailed hard and fast at an angle of thirty or forty degrees above a horizontal plane, so that the bees, in going in and out, ascend and descend an inclined plane. The object of the maker of these hives in putting on this kind of bottom-board was to facilitate the re-

moval of wax-worms, dead bees, debris, etc., from the hives. The bottom-board on each of these hives extends three or four inches below the entrance to serve as an alighting-board. Two legs are nailed on the sides of each hive at the rear, so that the hive, when on a level surface, is supported in an upright position by these two legs and the lower end of the bottom-board. The tops or covers of these hives are rough boards nailed to the tops of the hive bodies, with small holes in them to allow the bees to go up into the upper story, or honey-box.

Now, the directions usually given for transferring require the old hive to be inverted and a swarming-box of the same size to be placed on top of it to receive the bees; but it is evident that these directions are not practical in the case of sloping-bottom hives such as I have described above. How would you proceed? I propose to drive the bees from the box hive into the frame hive through a closed passage or runway connecting the two hives—this passage to be a foot or two long, six or eight inches wide, and an inch or two deep—the bottom and sides to be of wood and the top of screen wire. The end which connects with the old hive should cover and inclose its entrance entirely, and be bee-tight—the other end to be inserted into the entrance of the new hive, which should be raised by cleats an inch or two, above its bottom-board in order to receive this passageway.

To use this contrivance I would place the new hive on a table or bench fifteen or twenty feet from the stand of the old hive; then remove the old hive. Invert it and set it down close to the table on which the new hive is placed. After connecting the two hives by means of the runway or passage described above I would proceed to drive the bees out of the old hive. As soon as the queen and enough of the bees, say two-thirds, have gone into the new hive it should be removed to the stand formerly occupied by the old hive. I would set the latter close to and immediately behind the old hive, and connect the two by means of a passageway or gangway similar to the one used in transferring as already described. I would put a queen-excluder in this gangway in order to prevent the queen from going into the old hive. I should have stated that this gangway is to have a water-tight metal or wooden cover instead of screen wire, as in the case of the one used in transferring. By this arrangement the bees in the old hive can neither go out of nor into their hive without passing through the new hive; and the bees in both hives can pass freely from one hive to the other.

At the end of eighteen or twenty days I would place a bee-escape in the passageway between the two hives to prevent the bees from returning to the old hive; and if they are not all out of the old hive in 21 days I would smoke or drum them out, remove the old hive, and split it up into kindling—after having saved the combs, of course. Will this plan work or not?

Halls, Tenn., Jan. 9.

J. C. SAWYER.

[We believe you would find it much quicker to pry the cover from the box hive, put a box above it, and drum the bees up into it. It is not essential that the box hive be inverted, the only reason for doing it being that it is usually easier to do it than to remove the cover.—Ed.]

## Dead Bees in Front of Outdoor-wintered Colonies; the Mistake of Screening Bees in the Hive

Last fall I purchased two colonies of bees in what seemed to me to be old home-made hives which evidently had been used for a long time. The bees seem to be very lively, however; and after keeping them outdoors during the strenuous winter we have had I notice that every bright day about two dozen or more bees come out of the hives and freeze. I accordingly moved them into the stable, where the temperature is considerably warmer, placing the hives so they faced south, and put some wire fly-screen over the entrances to the hives. During the last week the bees have evidently been "cleaning house," and pushed out through the screen several teaspoonfuls daily of a substance resembling brown sand, and they have literally jammed each other up against the screen in their efforts to get out, so that about 25 or 50 seem to die each day. Thinking they might be

hungry I have given them a little syrup through the screen, although upon examination of the frames I found ample stores in the combs. Would you advise me to take the screen off the entrances of the hives and let the bees have access to the stable, and possibly fly out of the door if they wish? or would you recommend some other treatment?

Chicago, Ill.

C. F. CHILDS.

[During the winter you will always find some bees in front of the entrances of colonies wintered outdoors, even when they are wintering normally. However, during this past very severe winter it is possible that there were more dead bees coming out than was proper.

It was all right to take the hives and put them in the stable where there was less exposure; but it would have been better if you had taken them down into your cellar and darkened the windows so that the bees could not fly out. In any case it was a mistake to put wire cloth over the entrances, and we are a little fearful that it may have resulted in killing all the colonies. When bees are confined in a hive in this way it is almost sure to cause trouble. We advise you to remove the wire cloth at once; and it would be better for you to take the colonies down cellar and darken the windows, so as to keep them from flying out.—ED.]

### Bees Flying from Six to Eight Miles

I quite agree with Mr. Doolittle in his theory that bees fly several miles in gathering nectar, but can go him one better, for I have traced my bees over six miles, and know they fed still further. I am well aware that a great many people think it is impossible to follow the flight of a bee; but it is a very easy matter at certain times—on a windy day, for instance.

The first time I discovered my bees working so far from home was by accident. I had been working at an out-apiary, and was returning home in the evening. When six miles from home I noticed hundreds of bees crossing the road on both sides, and was much surprised, knowing of no apiary in that neighborhood. In fact, this was in the tules, and there was no residence for miles around. We were having what we call one of our north winds, which blow here at times for three, six, or nine days. I was traveling facing the wind all the way home. The bees were returning home. The wind being very strong for them to fly against, they flew low and slowly. Being in their path of flight, as I was, and traveling in the same direction, it was an easy matter for me to trace them all the way home.

This was my first knowledge of bees going so far; but since then I have traced them a number of times for seven and even eight miles. Most authorities that I have read claim that bees travel only from one to two miles, which is only a theory, according to my experience.

Woodland, Cal.

L. B. CAPPS.

### Six Questions

1. When bees are smoked, is the honey with which they gorge themselves lost, or do they replace it in the cells?

2. At how low a temperature in spring is it safe to open and manipulate the brood in the hive without chilling?

3. Is it all right to let the rays of the sun shine directly on the frame of brood and eggs when one is handling them?

4. What is enameled cloth?

5. I have heard it contended that the rendering of combs infected with foul brood is not necessarily done at a high enough temperature, nor the heat continued for a long enough time, to kill the germs, and disease may be spread by the use of foundation manufactured from wax thus carelessly rendered. Is there any thing in it?

6. How far back does foul brood date?

JAMES M. MUNRO.

Slate River, Ont., Can., Jan. 22.

[1. I believe it is not definitely known whether the honey with which the bees gorge themselves when they are smoked is consumed by them or replaced later in the cells. Some of it is undoubtedly consumed, but perhaps a part of it may also be deposited in the cells again. Probably it would depend on circumstances.

2. Opinions differ as to how low a temperature brood will stand for a short time; but it is safe to say that it is unwise to manipulate combs when it

is too cold for bees to fly, unless one or two from a hive are taken out for only a moment or two to make an examination—for instance, to determine the quantity of stores the hive contains.

3. It does no harm to let the sun shine directly on a frame of brood; but at the same time it wouldn't be good policy to leave such a comb exposed to the strong heat of the sun for any length of time on a hot day.

4. Enameled cloth is what is called table oilcloth in many localities.

5. Foul brood has never yet been traced to foundation made from foul-broody combs. There are plenty of other ways, however, in which it is known to spread, and spread rapidly. It does not seem impossible that wax rendered in a solar extractor, and made into sheets by the dipping process without being thoroughly heated, might transmit the disease; but the thorough boiling that the wax undergoes when properly rendered and then refined and sheeted in a modern foundation-factory surely kills all traces of the trouble.

6. It is not definitely known how far back foul brood dates. Some of the very old writers mention brood disease, and it is not unlikely that this was foul brood of one type or the other.—ED.]

### The Best Feeder for Colonies in Buckeye Hives

1. For feeding weak stands in the spring, do you consider the Alexander feeder as good as any? Early in the spring, when the weather is cool some of the time, warm syrup can be poured into the feeder each evening without opening the hive and thus losing heat. I got 30 Buckeye hives with sealed covers last fall. I know the Doolittle feeder is recommended; but after the Alexander feeder is in position it seems to me it would be better for weak stands when there are strong ones in the same yard. The bottom-board of the Buckeye hive is 2 in. wide, or a trifle over. In order to use the Alexander feeder it should be 2 inches deep. How much syrup will it hold? and how will the feeder fit the Buckeye hive? I have been troubled sometimes by strong stands robbing weak ones; so I am a little afraid of the Boardman for weak stands.

2. It seems to me the Alexander plan for dividing is the surest and one of the best methods. Do you know of any better way?

3. Which side of the Buckeye bottom-board is better for summer? It looks as though the bees would be inconvenienced in trying to get up on the combs when the wide side is used.

4. Is the Japanese buckwheat as good as any for honey?

New Sharon, Ia.

FRED BRIGGS.

[We consider the Alexander feeder excellent for feeding weak colonies in the spring. One objection, however, is the difficulty of attaching it to the hive, especially the double-walled chaff hive or Buckeye hive. For such hives we recommend the Boardman feeder. There need be no trouble from robbers if you attach it properly. We use the Boardman feeder almost exclusively at Medina, and have no trouble from robbers. We prefer it to the Alexander feeder because it is easy to see when the syrup is gone, and it does not require any special change in the bottom-board or the hive. In cooler weather we use the Doolittle feeder because the bees will not take the feed out of the Boardman feeder after cold weather sets in. We would not advise you to try to use the Alexander feeder in connection with the Buckeye hive.

2. Yes, we consider the Alexander plan of forming increase most excellent. We do not know of any thing any better.

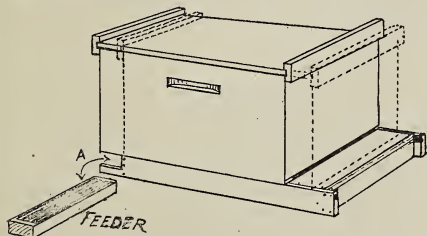
3. Some slight change was made in the Buckeye bottom-board of the hive after it was put out. We infer that you have the style that had the narrow entrance on one side and the wide entrance on the other. In winter, use the narrow entrance, and for summer use the deep one. The bees will have no trouble about reaching their combs. If you will watch them while they are flying heavily from the field you will find a lot of young bees hanging down from the bottom of the frames; and as the bees fly into the entrance they will fly clear through and alight on these bees.

4. With regard to buckwheat, we do not consider the Japanese quite the equal of the silverhull or the gray buckwheat for honey; but the Japanese gives a much larger kernel than either the silverhull or the gray. If you want honey we think you will prefer the silverhull.—ED.]



## Bottom-board Adapted to Holding the Alexander Feeder

I have made thirty new bottom-boards to accommodate the Alexander feeders. I made the sides three inches wide and let them extend the width of an Alexander feeder back of the hive, with a notch cut out of the top of the side rail the thickness of the feeder. I made the back end piece the entire width of the side rails, and set the ends in the side rails the same depth that I plowed for the floor pieces. I did not halve in the cross-piece at the front, but made it as wide as the bottom of the side rail to the floor board, and set it back three inches from the front end so the nails would not be so apt to split the sides.



The beauty of a bottom-board of this style is, no matter how uneven the ground or foundation of the hive may be, it will always fit up to the hive bee-tight, so no robbers can possibly enter from the back end. The side rails of the common bottom-boards are all thicker than the feeder, and it is a lot of trouble to block the feeders up to fit the hive.

Ponca City, Okla.

J. O. WILLIAMS.

## Sciatic Rheumatism Cured by Bee Stings

In answer to your inquiry regarding the bee-sting cure for rheumatism, I would say that, previous to my commencing with bees, I was very much troubled with rheumatism and sciatica—so much so that I was for weeks at a time confined to the house. About twelve years ago I bought a few colonies of bees, not thinking, of course, that they were going to cure me of my trouble. But I, like most beginners, was stung a few times. But they never caused much swelling. However, after a time I began to miss my rheumatic and sciatic pains; and as I took GLEANINGS at that time I noticed that a French scientist had declared that he had cured some very bad cases of rheumatism. Then I saw several items in the *Canadian Bee Journal* regarding the sting cure, so I began to think that, perhaps, was the reason I was no longer troubled with rheumatic pains. Since I began keeping bees I have been troubled but very little with rheumatism. I never feel as well as when I am working among the bees and getting a few stings occasionally. My hands are drawn up from the effects of rheumatism; but the pain is all gone. I have come to believe that the acid in the sting neutralizes the uric acid in the blood, thus removing the pain. I have heard of several persons who have had the same experience as I, who believe the stings cured them.

Blyth, Ont., Feb. 21.

ALFRED B. CARR.

[While visiting the Ontario Agricultural College we had occasion to say before the students of the agricultural school that, in our opinion, the bee-sting cure for rheumatism had been greatly overestimated; that we thought, in the great majority of cases, it was of no benefit whatever. We conceded, however, that there were some cases where relief had been afforded. Mr. Alfred B. Carr, who was present, afterward came to us and stated that he belonged to the latter class. As his experience was quite remarkable we asked him to write it up, which he did as given above.—ED.]

## Wintering Bees in Chaff Hives

My bees had a fine flight Feb. 20—the first since Dec. 12. They are wintering nicely. The weather during January and up to Feb. 20 has been very cold. The thermometer has several times registered from 20 to 30° below zero.

I have 110 chaff hives, all well packed and warm. I use a piece of old wool carpet over the frames. I

then fold three bran-sacks over the carpet. On top of this I place a bran-sack containing a bushel of chaff or dry sawdust. The wool carpet absorbs the moisture better than any cotton material. I find that bees, as well as people, like the warmth of woolen blankets during cold weather.

The main thing in wintering bees in chaff hives is to keep them very warm on top. I close the entrance, except a space 2 inches long by  $\frac{3}{4}$  wide. There has been a good deal said about the extra expense of chaff hives. The difference between a single-walled and a chaff hive is only 30 cts. I have chaff hives that have stood on the same spot for 30 years. Why fuss with paper, and build clamps, when 30 cents extra will buy a chaff hive that will last a lifetime? My bees are blacks and hybrids. Sixty pounds of comb honey per hive has been my average yield year after year.

Fair Haven, Vt., Feb. 22.

I. N. HOWARD.

## Questions from a Beginner

1. Are Italians as apt to rob as blacks?
2. Which is better—to jar bees off the frame or brush them off?
3. Will there be any brood in the hive 21 days after the first swarm is cast? If not, wouldn't this be a good time to transfer?

Huntley, Ont., March 19.

CAMERON BLACK.

[1. It depends more on the individual colony than upon the strain of bees or the race; but on an average we suppose Italians are a little more likely to rob than the blacks. However, this is not because of any greater desire on their part to get honey for nothing, but because of the fact that they are more industrious than the blacks, as a rule.

2. It depends altogether upon circumstances as to whether it is better to jar or brush bees from a comb. Briefly, we may say that a combination of the two plans is often the best. It irritates bees much less to jar them off; and the best plan, therefore, is to shake off all you can and then brush the few bees remaining. Some bees are much harder to dislodge from the combs than others. Italians cling tighter than blacks, for instance. Of course, there are certain times when fresh honey is being brought in when it does not do to shake the combs very much, for that would spill the green honey over everything.

3. It depends on circumstances as to whether you would find brood in the parent colony 21 days after the first swarm issues. If for any reason the swarm had been delayed till the young queens were practically ready to hatch, one of these young virgins might be mated by the seventh or eighth day following the issuing of the swarm, and would be laying within two or three days afterward.—ED.]

## A Sweet-clover Crank

My hive-stands rest on posts two feet high, so as to be above the high-water mark. I live on the bank of the river, and two years ago I lost most of my bees by high water.

I am called a "sweet-clover crank" by my neighbors; but some of them are coming to my way of thinking. I have about one-fourth acre of white sweet clover, and I find that my horse and cow eat it as readily as any other grass. This season I am going to experiment cutting it for hay. Last fall, when the seed was ripe, I flailed out about a bushel of seed and gave it to my neighbor. He has a stony pasture of about fifteen acres which he sowed with the seed I gave him.

I believe sweet clover will soon take the place of alfalfa. To insure a good stand I sow oats with it. Of course, different soils and different localities may make a difference.

Wakarusa, Kan.

M. E. MCFADDEN.

## More than One Hive Needed on the Scales to Indicate What is Being Done

I note in *Stray Straws*, p. 98, Feb. 15, your answer to Dr. C. C. Miller, where you speak of a scale *hive*. I found out long ago that one hive on a scale is not sufficient to indicate accurately an apiary's losses and gains, as different colonies vary so much when gathering honey, when apparently just as strong. I used to have two colonies on scales. Of late years I have four. I made one for the purpose, which cost about \$5.00, and I find it very satisfactory. I can tell accurately the gain or loss of the apiary. I record the weight each evening when interested.

Williamsburg, Ia.

M. W. HARRINGTON.

### Japanese Buckwheat Not Good for Honey

In your buckwheat booklet be very careful not to give Japanese buckwheat too much praise, especially as a producer of honey, it being practically worthless for nectar—here at least. We do not get a good crop of honey from it one year in ten. It frequently gives very large yields of grain, and just about as frequently none; and I have never yet seen such crops of Japanese buckwheat as I used to see when the gray and silverhull were sown, and when you could not get bees enough to gather the nectar. We once had an average of 70 lbs. per colony of section honey and winter stores in a total run of 14 days; but we are extremely lucky to get even winter stores from Japanese now.

#### BUCKWHEAT NECTAR SECRETION.

Buckwheat does not ordinarily secrete nectar after 11 A.M. Up to that hour honey is seen glistening in the five open nectaries of the bloom. After that time of day, unless a light afternoon shower, followed by murky atmosphere, intervenes (when occasionally nectar is again secreted and the bees go to work), the bees gather but little or no honey.

After once eating pure well-cured buckwheat comb honey, three-fourths of my private customers will have no other, and can not be induced to eat either clover or basswood. It must be well ripened, however. Buckwheat honey has a poor standing in the market, probably because it looks dark, while the demand is constantly increasing from educated honey-eaters. I have made, in the past, two shipments of buckwheat honey as far west as Kansas City, Mo., and generally can not nearly supply the demand.

Frenchtown, N. J., Jan. 18.

W. W. CASE.

### Value of Buckwheat, Both as a Honey-plant and for Flour

I think that buckwheat is a good paying crop. I sow a small patch every year. I had out about two acres last year, and got enough so that I sold 1260 pounds of flour at 4 cts. a pound, and had plenty for our own use. I used the bran for my cows. It is a very good feed for dairy cows. My bees, too, made a good supply of winter stores, and some surplus for us to eat on our cakes. I sold all of this flour at retail in 25-lb. sacks to my neighbors, and I also sell them some honey once in a while. I sow buckwheat early in the spring in order to plow it under for a fertilizer. It is good for the soil, and I get some honey from it. The buckwheat that I plant for seed is sown the first week in July. I have tried it earlier, but it does not seem to fill when the weather is too warm.

There are none of the ordinary prepared mixtures that will take the place of the real old-fashioned buckwheat cakes for me, and I think there are a great many others who would feel the same way if they were taught what the real thing is; but we must tell them in some way how good these things are, in order to sell our buckwheat and honey.

Lake Cicott, Ind.

THOS. C. JOHNSON.

### The Papaya, or "Pawpaw," of the South, etc.

Mr. A. I. Root:—I am glad to see that you like mangoes and guavas, and the other tropical fruits. As I was born and lived in British Burma until about ten years ago (I am now 22), I can appreciate your feelings over a good mango. I wonder if you have ever eaten the papaya, or pawpaw. The fruit varies in quality somewhat, but a good one is good. I will send you a few seeds of it from Burma. It fruits under a year old.

Savannah, Ga., March 20.

CHAS. E. A. HALE.

[Our older readers will recall that I have several times written up the tropical tree that bears luscious "mushmelons." Those we have here, however, do not often fruit inside of a year, and I am going to take great pains with the seed so kindly sent from British Burma. These trees bear fruit every month in the year, and the fruit is a celebrated remedy for indigestion.—A. I. R.]

### Form for Holding the Frame when Wiring

As I have never seen nor heard of any one wiring frames as I do I will try to tell how I do it.

I use a box or table just high enough for a work-bench, and take a board about an inch larger than the frames I intend to wire. I lay one side of this

board on the bench, place something under the other side, so that it will be about two or three inches higher, and then nail it solid. I then get a board one inch thick and saw it the size of the inside of the frame, and nail it on the board I have already nailed down. I put a frame over it and let the frame down until the holes in the frame are just a little above the inside board; then get a strip just large enough to fill the space between the frame and the bottom board (the one that is standing sidewise on the box). These are then nailed to the bottom board. I fix a place for the spool of wire about a foot from the bottom board, and nail a small staple near the first hole in the frame, but far enough away so that I can drive the tack in after I have my frame wired. I am then ready to begin wiring. By having the board on the inside of the frame, and cut to fit, it holds the frame solid and square.

Waldo, Ark., Feb. 6.

J. W. HOSIER.

### Groove-and-wedge Top Bar All Right

I frequently notice in the bee papers that the wedge-and-groove top bar is condemned. Now, I use that kind of bar, and I think it is the best that is now before the beekeepers if made right. That is where the trouble lies. Some manufacturers make the wedge too small for the groove, and some of the wedges about right for half their length, then begin to taper off to a point. Out of some lots we have had to throw away one-third of the wedges and fasten the foundation with wax. All wedge-and-groove top bars, if made right, work to perfection if directions are followed. The Madary top bar is no good in this locality. If the foundation is not drawn out at once it will shrink and let the foundation fall down.

Metz, Cal.

H. E. THAYER.

### Turkeys and Ducks Eat Bees

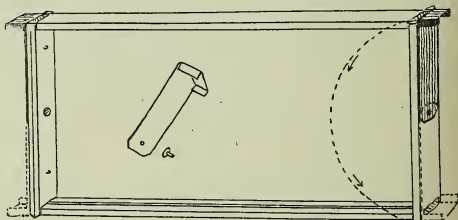
On page 118, Feb. 15, Stephen Anthony makes the statement that turkeys and ducks never eat bees. I beg to differ here, as I had a hive of bees and some ducks in the same yard several years ago, and the bees *did* get eaten by the ducks—so much, in fact, that I had no more bees at the end of the year than I started with in the spring. Several of the ducks would stand in front of the hives and eat the bees. I do not know whether all of them did or not.

Monaca, Pa., Feb. 23.

CHARLES P. BLAIR.

### Reversible Frame

The illustration shows my son's (Alex. Crisler) reversible frame. The metal strap is supposed to have a hole near the top, and a corresponding lug on the end bar to hold it in place. It can be used



on any frame of Langstroth size. The strap would be better if made of thin steel; but heavy galvanized iron would answer.

Walton, Ky.

J. G. CRISLER.

### The Washington Honey-producers' Association

A cooperative organization known as the Washington Honey-producers' Association was perfected at North Yakima, Feb. 27th, and the following officers were elected from its board of directors: Virgil Sires, North Yakima, President; J. B. Ramage, North Yakima, Vice-president; Robert Long, Yakima City, Treasurer; A. E. Burdick, Sunnyside, Secretary-Manager. It is their purpose to buy their supplies and to sell their product as a unit through their manager.

Sunnyside, Wash.

A. E. BURDICK, Sec'y.



# Poultry Department

A. I. Root.

In all thy ways acknowledge him and he shall direct thy paths.—PROV. 3:6.

After the boys had taken four of my ducks, as I have explained, I was obliged to decide it would not answer any more to let the ducks loose in the main canal; but as soon as I tried shutting them up, the eggs began to drop off. In order to get the benefit of the canal, Wesley and I constructed a fence along the margin of the stream, setting the posts in the rocky bottom. This was possible because there are quite a number of live-oak trees along the margin of the stream that reach out over it. We set the posts near where one of these trees bent over the stream or had overhanging branches. With a crowbar we made a small cavity in the rocky bottom, and then spiked the post to the trunk of the tree or the limbs above. Then by stretching barbed wire and poultry netting on these posts we had a stream, perhaps five to ten feet wide and about one hundred feet in length. Now, when the ducks had access to the full width of the canal it required much less feed, as I have already explained. We concluded that what could not be *cured* must be *endured*. This time the boys have not as yet come on to our premises; but my last and only drake was lost, as I have previously explained, *after* we had constructed this fence in the creek. The boys broke through the poultry netting and barbed wire and killed my duck as I explained. Now, although I have had many difficulties and perplexities in my life-work, I have also had many surprises, or, if you choose, answers to prayers. A great many times when these prayers are answered I find much *more* has been given me than I asked for or expected. Let me explain how it is in this case. After the boys were arrested I found that I was once more at liberty to let my ducks out into the open canal. I then said to Wesley, "There! we have gone to the expense and trouble of making that wire-cloth fence along the canal, when at present we do not need it," and it stood for some little time unused. When

my first incubator brood of ducks got about eight weeks old I felt sure that it would be very much to their benefit, and lessen the amount of food, if they could have access in like manner to the water in the canal. Let me explain that the best authorities on ducks have decided that it is not advisable to let ducklings out into the open water before they are four or five weeks old, or old enough to have some of the real

feathers that take the place of the down that is on them at first.

When six weeks old they are almost fully grown. I felt sure that they wanted water in order to do their best. Now, ducks or especially ducklings need only a very small yard if they have access to water. One day I said to Wesley, "Why, look here; we have got the nicest yard for the ducklings in the world if we just put some fencing *across* that strip we prepared for the big ducks. In a very short time we had it all fixed. The first day that they had access to this water amply repaid me for all the time and trouble it had caused; and just a few days later we fixed another similar place for the four-weeks-old ducks. See B and D in the diagram. Now about this strip of fence we put along the margin of the stream, about 100 feet long. The young ducks, each brood, have between forty and fifty feet for a swimming-yard. When I let them out of the house in the morning it would do *anybody* good to see the ducks go down into the water. They fairly make the water fly as they go from one end to the other of their yard. The amount of feed needed is also very much less. I can hardly explain this, for it hardly seems possible that they could get a *very* large amount of food out of the running water in this narrow strip. The improvement in their appearance and progress was very marked at once. In fact, after they had been out in this water several days they hardly looked like the same fowls. I will have to explain to you that the salt water at high tide rises up into this water, and I verily believe that a little salt water mixed with fresh water is a benefit to ducks and ducklings. They seem to enjoy it very

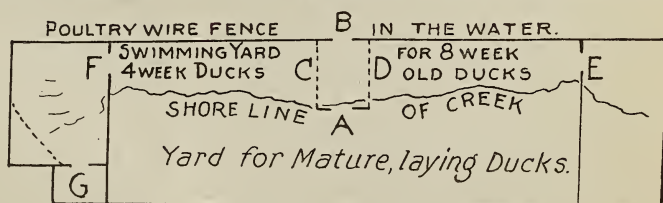


DIAGRAM OF OUR DUCK YARDS BORDERING THE DRAINAGE CANAL.

A, trap-door to admit laying stock into the stream. B, second trap-door, opening into outer canal. C and D, partition fence of netting. E and F, gateway for ducklings. G, duck house for young ducklings.

much indeed. Now, instead of this fence made along the bed of the stream at some little expense being money *wasted*, it is really one of the best investments I ever made. In connection with the above I want to tell you about another thing that I think I can call one of my "discoveries." Anybody who has had much to do with ducks and chickens, or especially with a brood from the incubator, has discovered how difficult

it is to get them to go into their house when a storm is coming up or you want to get them in for the night. By the way, I might mention that the only safe way, so far as my experience goes, for either ducks or chickens, is to shut them up every night at the approach of dusk and let them out again every morning, and I really enjoy doing this. The happiest time in the whole twenty-four hours is in the morning just at daylight, or a little before daylight, when I let my fowls loose and see them happy and rejoicing. In the morning is the time when domestic animals, after their own particular fashion, "praise God from whom all blessings flow," and I think we ought to follow them in this respect. Now to get back to our subject.

Many of you have found how difficult it is to get ducks or chickens into the coop at night, especially when the coop is in the middle of the yard. It is particularly so when you want to give them a little *larger* domicile because of their growth. If your brooder or your duck-house is in the *middle* of the yard you will find it a big job indeed to get them to go in, especially if a thunder storm is coming up suddenly. If you place it up against the fence at one side, you have a *better* chance; but then they will persist in running around behind it instead of going in. If you put it up in one corner it is still better. But even then they will wedge in between the wire-cloth fence and the side of the house, or get behind it or get into the corner. Now, at F and G in the diagram I have explained how we manage it. Instead of putting the brooder or the duck house in the yard, put it outside entirely, the door to it being in the corner of the yard. A better way is to attach the poultry-netting to *one side* of the duck-house and also the same on the opposite side.

If you drive your brood of chickens or ducklings up into the corner they have got to go in the door. A better arrangement still is to have the fence where I have placed the dotted line near G. In this arrangement you have a sort of lane like the letter V, and the building is right at the small end of this lane. There are few things that have given me more pleasure than this arrangement to get my ducks to go in when I am in a hurry. Just another thing about getting them to go into their house, especially if the house is a new one, in order to give them more room. Ducks, more especially the Indian Runners, have a habit of carrying their heads high; and, unless you have their doorway high also, they won't see it. Sometimes I have made an opening in the fence that I thought sufficient to drive them through. This ended in disappointment; for, instead of going through, they held their heads so high they could not see the opening at all. When you make the duck-house, make the door very high. When the ducks are little they can get into it without any trouble. But when you move them into a more commodious coop, according to their growth, you want a high door or they will get their heads up so they won't

see it at all. In this climate no sort of house is needed for protection, more than one made largely of wire cloth with a large open door and wire-cloth sides. In order to manage ducklings as well as chickens, you ought to get well acquainted with them (as I have emphasized before), and *keep* acquainted. In fact, I know of few things more interesting than studying the peculiar habits and instincts of these wonderful creatures.

Now, then, in conclusion, if you want to have fun and profit too from ducklings, you want to give them *running water*. Nothing will answer in place of it. If you want to get an egg from every duck as regularly as the sun rises and sets, give them running water, study their wants, given them plenty of green food, and learn to love them, and they will love you in return and give you *both* enjoyment and profit.

All the fence needed for ducks, and small chickens also, is inch-mesh netting two feet wide. Of course, two-inch mesh, or even three-inch, will hold mature ducks; but for ducklings and small chicks nothing larger than inch will do. As ducks subsist (and thrive) largely on roots of almost all kinds of vegetation, especially in or near water, there is a great saving of expensive grain, and meal for mashies, by having them a great part of their time in "running water."

#### EGGS THAT DO NOT HATCH; HOW FAR ARE OUR INCUBATORS RESPONSIBLE?

On page 147, March 1, I mentioned that our sitting hens hatched almost every duck egg given them, while the incubator gave a duck for only about half the eggs, etc. As the Cyphers folks at Buffalo, N. Y., had requested me to let them know how I came out with *duck* eggs I sent them a clipping as above, and below is their reply:

*Mr. A. I. Root:*—Your letter addressed to the Cyphers Incubator Company for the attention of Mr. Farrington has been handed to the writer for attention. This has been done for two reasons: One is, that the writer was formerly an Ohio man, and thought perhaps you would like to receive a letter from a Buckeye boy; and the other is, that we have had considerable experience in operating incubators and brooders; in fact, we have hatched almost every kind of egg that could be mentioned in incubators. We have even hatched alligator eggs successfully, and to do this one must know a little more than the ordinary person does about running an incubator.

If we were in trouble in our apary we would not hesitate to write you, and know that you could give us information that would place us right; and we appreciate your position, and shall endeavor to treat you as we know you would treat us.

We have read very carefully the article in your "Poultry Department," a clipping of which you have sent us, where you state that there is a big complaint of eggs for the incubator being infertile, and that that recalls to mind the down-east "secret" of starting all eggs under hens before placing them in the incubator.

To place you right in this particular phase, we beg to say that neither the incubator nor the hen has any thing whatever to do with the fertility of the egg—that is, after the egg has been laid. The germ is on the inside of the egg, is placed there before the egg is laid and enveloped by the shell. Now, regardless of where the egg is incubated, whether it is in an incubator, under a hen, or whatever it may be, the mode of incubation has nothing whatever to do with whether it is fertile or not. An infertile egg is an egg that contains no germ; and, regardless of its condition or manner of incu-



bation, it will never develop a germ. The germ must be deposited, and be in the egg before it is laid, and the hatching-machine will have nothing whatever to do with fertilization. However, the method of hatching does have something to do with the vitality; for if an egg is not incubated properly the vitality will be impaired, the germ will die, and nothing will come from its being incubated.

It is just exactly the same as a cell in a bee-comb. If the queen does not deposit the germ, it is infertile and will not produce a bee. We are sure you can see the point we are trying to make, and will understand more fully the principle of incubation from this statement.

We personally never expect to see the time when an incubator will be the equal of the old hen when she attends to the hatching business. If one were to take the results from natural incubation and artificial incubation year after year, the incubator would outclass the hens, because there is a certain per cent of them that are practically worthless as sitters. There is the same difference in hens that there is in people and incubators.

Mr. Farrington gave you some good information relative to operating your machine: but one thing that he overlooked was that the thermometer should have been changed as to its location. The position of the thermometer in the incubator is correct for the hatching of hen eggs; but if you are to incubate duck or goose eggs it is necessary that you lift your thermometer just a trifle. For duck eggs the thermometer should be about  $\frac{3}{4}$  of an inch higher, and for goose eggs about  $\frac{1}{2}$ . The germ in the egg floats to the highest point; and if you are to have the thermometer too low you will be running the machine at too high a temperature. The consequence is that a certain amount of the eggs will not hatch, due to excessive heat.

Instead of operating the machine with the ventilators wide open, as has been suggested, you should close the ventilators down to about half open, and continue this way until they begin to pip. Then increase the heat about one degree, close the ventilators tight, and leave the same in this position until the ducklings have started to hatch out, when you can open the ventilators about half way.

The eggs, in your part of the country, should be moistened; and one of the best methods is to take a clean whisk broom and sprinkle the eggs every morning after they have been aired and cooled; and if in a temperature of 60 to 70, they should be aired and cooled for from five to eight minutes twice a day. If one is at all observing he will notice that, when the old mother duck sits on the eggs and hatches them the natural way, she will leave the nest at certain intervals, take a swim on the pond, come back with her feathers real wet, and hover over the eggs. Besides, the nest is usually built where it is damp and there is lots of moisture. This also assists in supplying a great amount of humidity.

We are acquainted with a poultryman who has made a wonderful success in hatching duck and goose eggs in incubators, and about the 20th and 26th day he dips each one of the eggs in water that is heated to a temperature of 95 to 100 degrees, allows them to remain a few seconds, when they are removed and placed in the egg-tray after being wiped or dried off.

We have endeavored to make our statements clear, and trust that you will understand the directions we have given you. If we can serve you any further, do not hesitate to write us, for we are deeply interested in your particular case, and nothing would please us more than to render you such assistance as would enable you to make an absolute success in hatching your ducks.

Buffalo, N. Y., March 23.

W. C. ELLERIN.

Of course we all agree to the above; i. e., that no hen or incubator can do *any* thing with an egg that has not the fertile germ, and I am very glad to see the writer "take off his hat" to the sitting hen and give her such a high compliment. Perhaps I should not have used the word "infertile" in my heading in that March 1st journal. Since that article came out I have started the incubator again, and again got about a 50-per-cent hatch. At about the same time I gave a Bantam hen *eleven* duck eggs. Of course

she could not well cover them all; but it was done purposely for a test. All started germs promptly but one; but on the 29th day she came off with *ten* nice ducks. I suppose the delay was because she could not keep all of the eggs all of the time warm enough. With my exactly accurate incubator I fear I had them *too* warm, especially at the start, for they were pipped, some of them, on the 24th day, and were all out, except those "dead in the shell," on the 27th. She aired her eggs a long time, especially on hot days (and I tried to imitate her); and while the eggs were pipped and the ducklings poking their heads out of the shells she took a long promenade, as unconcerned as could be. Probably *she* had never read the careful instructions about "how to run an incubator" about hatching time. Now for my question once more: Have we any incubator that will start the germ "*in the egg*" in as many eggs (or as large a percentage of the eggs) as does the sitting hen?

HOW TO MAKE THE CHICKENS "IN THE BACK YARD" NOT ONLY SAVE THE BUTTER (SEE PAGE 147, MARCH 1), BUT THE HIGH-PRICED HAM FOR SANDWICHES.

The above is a "long-winded" heading, I admit; but I couldn't well make it shorter. Well, to get down to business, read the following from one of our old-time friends:

Dear Uncle Amos:—Being a constant reader of GLEANINGS, and interested in every thing contained therein (covers and all), and knowing that you as well as myself are interested in ferreting frauds, I am enclosing herewith a letter received to-day in answer to a letter of inquiry written by myself in reply to their advertisement.

Union Center, Wis., March 12.

ELIAS FOX.

And here is the letter our good friend encloses:

Mr. Elias Fox:—Guess you misunderstood our ad. We got tired of selling our chickens in the open market at ten and twelve cents per pound, and a year ago last fall we figured out a plan that we have used ever since, and are still using, that brings us *twenty-five* cents per pound, *live weight*, for every chicken, *old or young*, that we market, and we market chickens twice a week.

We expect your more or less skeptical opinion; but if you will be shown we will prove to you that our claim is good and that we make good.

We guarantee to refund your money if you're not satisfied. To get our advertisements in the magazines, and abide by the law, we must be prepared to back up our statements, and also be able to show that you can do the same as we are doing, or return your money to you. If you buy our method, and do not think it is worth a dollar of any chicken-raiser's money, write us for your money and we will return it to you.

What we want is to have you try our method. There are so many schemes out to grab off the dollars that we have made the following arrangement with our bank for the benefit of those who are skeptical about sending their money direct to us.

You can send the price of our method, \$1.00, to The Citizens Trust Company, of this city, requesting them to hold it for you thirty days. Notify us at the same time, and we will send you the method and you can try it. If you can not get twenty-five cents per pound, live weight, for old or young chickens, or the method is not entirely satisfactory, ask The Trust Company to return your money and they will do so. We enclose a blank that you can use for convenience. This protects you absolutely. We are doing this on the theory that the majority of people will not ask for their money back if they get value received.

CHAS. W. FESTER, Man.

Elkhart, Ind., March 9.

The above sounds fair and liberal, and I at once sent the dollar. By the way, when I was in Portland, Oregon, some years ago, I found the ladies of the church were making and selling little chicken pies at 25 cts. each; and, if I remember aright, I was told a fair-sized chicken made five or six of these little pies, and they sold, too, "smoking hot," like "hot cakes." I wondered if the "secret" was not something on this line. See below, which came in due time:

*A. I. Root*.—Here is our method: You know that ham, such as is used for sandwiches, costs from thirty to forty cents per pound. We make what we call minced chicken, to be used in the place of ham, for sandwiches. To get it started we make about four pounds. We take it to a restaurant, lunch room, or any place where they sell lunches. We tell the proprietors that we have something that is cheaper and better than ham for sandwiches. We ask him to give it a trial, with the understanding that, if it does not sell, he will be nothing out. We tell him that, if it does sell, we should like to arrange to furnish it to him.

You see a chicken sandwich is pretty good eating. During the fall of 1910 we got 38 cents per pound. Last fall we cut the price to 25 cents, and are still getting that price. We usually make it so that ten pounds of live chicken will mince about twelve pounds. After you have made it a time or two you will know about how the weights will run.

We try to take in a supply on Tuesdays and Saturdays. We suppose you will say, "That is a hot proposition." Don't turn it down, but just try it once. Go out and get the oldest, toughest chicken, and weigh it up; make some according to formula attached, and try it out. We buy chickens of the neighbors at market price right along. We work them up this way, and it goes a long way on feed-bills, I assure you. You see an old rooster looks like a springer with this plan. Now, Mr. Root, we realize that there are some people who do not live in a location where they can use this to advantage; others do not want to bother with it. We do not want to take a cent from any one who can not put this to use. If for any reason you do not want it, advise us and we shall be pleased to return your money. All we ask is, if we return a man his money he should forget all about the plan.

#### OSOLO POULTRY YARDS.

Elkhart, Ind., March 23.

#### RECIPE FOR MINCED CHICKEN.

Weigh chicken alive. Dress for boiling. Boil until done, and keep covered with water; then take the chicken out and let it cool. Take the meat from the bones and grind through a food-chopper. Weigh the ground meat. Take five crackers for each pound of live weight, and roll fine; then stir into the boiling broth. After this has boiled for a few minutes, thicken with flour as for flour gravy, until it is thick. Weigh the gravy. The weight of the gravy when added to the ground chicken should equal the weight of the live chicken. If there is not enough gravy to make this weight, add boiling water. If there is too much, take out some. Mix the ground chicken and gravy together thoroughly, and season highly. Pour into pans. White-lined granite mixing-bowls are the best. A few trials with this recipe will make you an expert.

I really believe the above is the most valuable "secret" I ever invested in, and I especially admire the venders for not having any clause about secrecy or giving the plan to your neighbors, etc. They don't say what the sandwiches sell for, but I have paid as high as 15 cts., and got very little real chicken at that. Down here in Florida, at one of the stations, the colored folks are, I am told, making quite a little money by selling a chicken sandwich for a dime, and they are really excellent, too, as I can testify, although they are not "minced chicken." Some of you may think it hardly courteous, to put it mildly, to "give away" this enterprise. To which I reply,

it is folly in this day and age of print to expect to keep out of print any thing of value; and, finally, to reward these people, since they are so fair, if any of our readers build up a profitable trade in the "sandwich" line, will they not be fair enough to send the Osolo Poultry Yards a dollar, as I did?

#### MUSTARD FOR LAYING HENS, ETC.

On page 122, Feb. 15, I spoke of mustard to start hens laying. Here is something further in regard to the matter, which I clip from the *Petaluma Weekly* of March 20, from our good friend L. E. Keyser:

At one time I believed that nothing on earth would make hens lay. Then when some rather worthless pullets were obstinate and refused to lay when I was giving them the best of feed and care, I resorted to the "Strikebreaker," and in a very little time they were laying nicely. Right here it occurred to me that, as these pullets were not valuable as breeders, and would never be used as such, it stood me in hand to get all the eggs out of them I could in the shortest possible time, regardless of future results. So we kept them laying all winter, during the summer, and late into the fall, when I thought it best to dispose of them. A sufficient number did not get into good feather at one time to make a shipment, so they were allowed to live, and about the middle of January the "remedy" was applied, and they commenced laying again with the exception of a few which were killed for home use, and laid steadily until disposed of early in September. I doubt if, without the use of a stimulant, these hens would have proven a paying proposition; but as it was, I secured two seasons of good laying out of them.

I have discovered this: It makes no difference how many eggs a hen lays during the winter, she will lay just as many during the spring and summer as though she had been idle all winter, and the winter eggs are all clear gain. If the number of eggs a hen lays is limited, the sooner we get the bulk of these eggs the better. It saves feed. It adds to the expense to feed this preparation; but the additional expense is more than met by the increased production, and it is not necessary to feed the dope all the time. Get the hens started and feed right, and they will keep going. When there is a let-up in the egg yield, feed more dope. This seems to me a logical way to treat hens not good enough for breeders. If they last only one season we know that is all they are good for; and if the hens have any constitution at all they will last two laying seasons, and lay heavily all the time except after the molt.

He also adds the following from a letter he received:

I am at a loss to know whether to approve or otherwise your action in publishing in the *Journal* for Dec. 6 the mustard formula for egg-production. I immediately invested in five pounds of mustard, one pound of saltpeter, one pound of sulphur, diluted with fifteen pounds of meat meal. At that time I was feeding every imaginable tidbit to 400 yearlings, and getting four dozen eggs per day, which hardly more than paid feedbills. In ten days I was getting 12 dozen, and in January averaged 65 per cent for the flock—lame, halt, and blind. Evidently all the *Journal's* subscribers took the bait, for to-day the price of eggs has reached the hitherto unheard-of low price of 24 cts. on Feb. 24.

I have been using mustard during the past winter, and have never had our hens lay so well before. Besides the ground mustard we are now feeding green mustard. A year ago my neighbor Rood had a plant of Florida mustard about as high as my head, with great crinkled leaves, of which the hens were exceedingly fond. He let it go to seed, and my plants were grown from this seed. It is a very rank grower on our sandy soil, and the hens just fight for it. Can we not "kill two birds" by giving them the "mustard tonic" and green feed all at one time?